JUL 6 1922

Business By Graphs—Page 25

THE IRON TRADE REVIEW

Registered U. S. Patent Office

Published Weekly
VOL. LXXI. No. 1

CLEVELAND, JULY 6, 1922

Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

Six Dollars a Year
Single Copy 25 Cents

GENERAL JUL 6 1922
UNIV. OF MICH.

LAKE ERIE
Bolts and Nuts

A Large Stock on Hand

We can make immediate shipment of Bolts and Nuts—any size or description—any quantity—hot or cold made.

The use of *our products* guarantees the reliability of *yours*.

May we send you our *"Bolt and Nut Handbook?"*

The Lake Erie Bolt & Nut Co.

915 East 63rd St. Cleveland, Ohio

The Complete Circle

Truscon Pressed Steel fills the Complete Circle of your Steel Stamping needs

Truscon Steel Platforms for Lift Trucks

SAVES MONEY IN HANDLING MATERIALS

A SIZE FOR ANY TYPE OF LIFT TRUCK

Write for Information and Estimates

TRUSCON STEEL CO.
YOUNGSTOWN, OHIO.

WAREHOUSES AND SALES OFFICES IN PRINCIPAL CITIES

Vol. LXXI THE IRON TRADE REVIEW No. 1
Registered U. S. Patent Office
Cleveland, July 6, 1922

Strikes Fail To Halt Industry

June Shows Eleventh Consecutive Month's Gain in Pig Iron Production—New Business in Good Volume—First Half Car Orders Exceed 100,000—Sheet and Tin Plate Shipments Heavy—Labor and Car Shortages Felt

NATIONWIDE strikes now intensified by the walkout of the railroad shop employes still fail to have any marked impress upon iron and steel conditions. No illusions are entertained, however what the effect will be, should a curtailment of transportation facilities eventually be added to the present narrow margin of fuel supplies under which the industry is working. At this time producers are most concerned with the immediate problem of meeting their order obligations which is complicated by labor shortages at this season, especially in the hot mills and by a lack of box cars notably in sheets. Offerings of new business are in good tonnage. Production this week is on a reduced scale because of the holiday, many mills being down for two days.

Free coke remains very scarce and is commanding high prices. A furnace paid $10.50 ovens for 5000 tons of by-product fuel. Up to $9 ovens has been paid for both furnace and foundry beehive coke. Production in the Connellsville region still gains slowly.

Iron Keeps Up Gain

Despite all the present handicaps pig iron production continues to gain, the total in June being 47,070 tons greater than in May, a one day longer month. This marks eleven months of steady increase. The June output was 2,356,418 tons. The daily average for June was 78,547 tons, as against 74,495 tons in May. The June rate of production was 182 per cent above the most depressed point last July. The gain in the list of active furnaces was even more impressive, numbering 15. On the last day of June, 190 furnaces were blowing compared with 175 in May.

Heavy products particularly plates and structural shapes more clearly reflect the strength accumulating from recent active demands. Prices now are on a minimum basis of 1.70c Pittsburgh, due to the fact the Carnegie Steel Co. which has been quoting 1.60c, has discarded the latter figure, beginning this week. Eastern plate mills have been booking third quarter contracts at 1.80c to 1.95c Pittsburgh, and report the best consuming activity in two years. Steel bars remain the most active line of the market with Middle Western mills and deliveries ranging from four weeks to three months. Some buyers are offering premiums.

Mills Filled Heavily

Near capacity production of tin plate among independent mills is assured for a number of weeks by the heavy unfilled bookings. With a certain group of mills total orders recently were 3,500,000 boxes, or practically 90 days' full work. Tin plate and sheet shipments by the American Sheet & Tin Plate Co. during the first six months of 1922, were the third largest in history. Labor and box car shortages are causing sheet mills to run behind in shipments and deliveries now are 6 to 12 weeks in arrears. Hot-rolled strip has been advanced $2.

THE IRON TRADE REVIEW composite market average of fourteen iron and steel products has moved up again this week despite the readjustments incident to the freight rate reductions July 1. The average is $37.43; it was $37.22 one week, $37.12 two weeks ago.

Purchases of basic have stood out in a quiet week in pig iron. An eastern fabricating plant took 7500 to 10,000 tons and a Cumberland, Md. consumer, 5000 tons. June sales by furnaces with headquarters in Cleveland totaled 197,000 tons as against 184,000 tons in May. Chicago iron again has been advanced 50 cents to $1. After a selling drive a week ago at $18 Birmingham by three makers, southern iron now is generally firm at $18.50 minimum.

A large tonnage is represented by pending structural undertakings. Prominent among these are 8000 to 10,000 tons for a bridge for the Michigan Central at Niagara Falls upon which the American Bridge Co. is low bidder and 9000 tons for a power plant for the Brooklyn-Edison Co., Brooklyn, N. Y. The week's awards totaled 21,000 tons.

Car Awards at Peak

Domestic railroad car awards for the first half of the year totaled slightly more than 100,000, or 101,625. This showing has not been exceeded in 10 years. The June figure was 14,400. New awards are keeping up steadily, those of the week aggregating 4500 and including 2000 for the Western Pacific, 1250 for the Northern Pacific and 1175 for the New York Central. The war department is closing on 7554 cars of the European type.

Business Trend and Chart Section Page 25

THE IRON TRADE REVIEW

Registered U. S. Patent Office

Devoted to the Iron, Steel, Foundry and Metalworking Industries

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND

Member, Audit Bureau of Circulations and Associated Business Papers, Inc.

BRANCH OFFICES

BOSTON - - - - - - - - - - - - 426 Old South Bldg.
CHICAGO - - - - - - - - - - - 1147 People's Gas Bldg.
CINCINNATI - - - - - 501-505 Commercial Tribune Bldg.
HARTFORD - - - - - - - - - - - P. O. Box 1231
NEW YORK - - - - - - - 2203-2206 No. 220 Broadway
PITTSBURGH - - - - - - - - - 2148-49 Oliver Bldg.
WASHINGTON - - - - - - - - - 84 Home Life Bldg.
SAN FRANCISCO - - - - - - - 675 Monadnock Bldg.

FOREIGN OFFICES

BIRMINGHAM, ENG. - - - - - - - Prince's Chambers
LONDON, ENG. - 2-3 Caxton House, Westminster, S. W. 1.
PARIS, FRANCE - - - - - - - - - 224 Rue de Rivoli

Cable Address, IROTRAPEN, London

Subscription, United States, Cuba and Mexico, $6 per year. Canada and other Foreign Countries, $8.50 per year.
Entered at the Postoffice at Cleveland as Second Class Matter

Copyright 1922 by The Penton Publishing Co.

IN THIS ISSUE

	Page
Iron and Steel Market Review	1
Editorials	2, 3
Iron, Steel and Scrap Prices	4, 70, 74
Index to Market Reports	5
Iron and Steel Markets	5 to 15
Foreign Markets	20 to 23
Agricultural Outlook Promising	24
Business Trend Section	25 to 28
Making Material Handling Safe	29
Greatest Number of Industrial Accidents Occur in the Handling of Material—Use of Proper Trucking and Conveying Equipment Is Aid to Safety—Discipline and Morale Are Essential Factors	
Developing an Electric Furnace	33
Rebuilds Plant Without Shutdown	35
Steel Trade Outlook Promising	38
Practical Training for Foremen	40
German Competition Is Overrated	43
Testing Society Work Expands	46
Steel Exports Gain 32,000 Tons	49
Alloys and Alloy Steels Favored	50
Tool Prices Advance in June	57
Railroad Tool Needs Feature	58
Construction and Enterprise	60
April Metalworking Tool Exports Decline	61
New Trade Publications	64

Field of Special Steels Expands

IT HAS been said that we are passing from the "steel age" to the "alloy steel age" and no doubt there is some foundation for this assertion. The use of special steels has proved economic in a long list of products, from shovels to automobiles, locomotives and battleships. The increase in alloy steel production, from 181,980 tons in 1909 to 1,787,852 tons in the record year, 1918, measures the rapid growth of the industry in this country. One reason for this growth has been the rise of the automotive industries, which have demanded steels of maximum strength and resistance with minimum weight. Consumption of special steels in other fields, however, is constantly increasing as the result of study and research, not only by alloy steel manufacturers, but by the principal companies interested in developing wider markets for nickel, vanadium, molybdenum and other alloys.

Certain groups of alloys have become accepted as most economic for certain purposes as the result of practice over several years. These principal groups have been classified and numbered by the Society of Automotive Engineers. Almost all known elements, from aluminum to zirconium, have been introduced into steel in varying quantities and combinations. In small quantities, manganese, silicon, titanium and other elements have proved useful as deoxidizers. In larger quantities, some of these elements have remained in the steel and imparted special qualities.

Experiments with special steels were made at intervals in the nineteenth century, but not until after 1880 was the modern alloy steel industry born, with the commercial production of chrome steel. Then came nickel and chrome nickel steels used in armor plate, crank shafts, ordnance, etc. Later, the discovery of the Peruvian vanadium deposits enabled the commercial use of vanadium and still later the use of the oil flotation process made economic the production of molybdenum for use in steels. Today we have nickel chrome vanadium steels used for armor plate and projectiles; high silicon steels for electrical sheets and springs, etc.; nickel steels for structural and constructional purposes; chrome steels, for constructional work and mining equipment, such as crusher plates and balls and stamp shoes; vanadium steels for springs, constructional work and tools; molybdenum steels for constructional work; high manganese steels used for resistance against abrasion, such as castings for dredge and mining equipment; and tungsten steels for high speed tools.

The research work proceeds steadily. Metallurgists have two important objectives at present, the production of stainless and noncorrosive steels and of heat resisting steels. Steels which will withstand various acids under varying conditions, such as piston rods in mine pumps and steels which will stand up under intense heat, as in burner nozzles and automobile engine valves, are the objects of research. As an example of development in stainless steels it is understood a steel works of international repute is employing 40 dentists, who are studying production of stainless steel bridgework. The use of nickel in cast iron is being analyzed. The production of molybdenum steels from nothing to 5000 tons monthly has taken place within a few years. Vanadium steels have proved their worth in locomotive forgings and castings, where the burden has to be lightened to meet rail and bridge limitations. The hard times in the steel business the past year have retarded experimental work, but the results obtained from research during and since the war have awakened iron and steel metallurgists to the possibilities of special steels. Research work now is going ahead more earnestly than ever, particularly in the lines of noncorrosive and heat resisting steels.

Export Recovery More Marked

BECAUSE of an increase of 32,000 tons over the April total, the May tonnage of American iron and steel exports may be accepted as further evidence of the recovery which has been in progress in foreign trade for the past nine months. Standing

alone, the May figure is not conclusive. But in relation to the trend of exports for the past year and a half, the May tonnage is of considerable significance.

Starting with February a year ago, the curve of exports turned downward, continuing steadily until last August when only 75,641 tons, the smallest volume since January 1909, was exported. Then began an upward movement which in May had represented an increase of more than 200 per cent. The previous months of September, October, November, December and January successively had registered a gain. Then came a reaction. February declined to a total less than December. The March tonnage rose to a higher point than any month in the previous twelve. April fell slightly. And now May gains in a substantial way.

Monthly rises and falls in the trend of iron and steel exports are to be expected as trade ebbs and flows. The generally sounder commercial conditions prevailing in foreign lands, and the more favorable domestic situation, which cannot but have an influence abroad, however, point to a continuing upward trend in steel exports.

Distinctive Feature

Among Business Papers Is Business Trend Section of THE IRON TRADE REVIEW

THE Business Trend Section of THE IRON TRADE REVIEW is the most distinctive feature of any of the many trade papers to which we subscribe. A brief study of the charts in this section is the quickest and most satisfactory means we know of obtaining a working knowledge of the business of the country. We do not see how a progressive manufacturer could afford to be without these charts.—*Arcade Malleable Iron Co., Worcester, Mass., H. P. Blumenauer, general manager.*

I carefully study these excellent charts, as they come out and they have proven valuable to me in many ways in my business and have also proven very interesting. I commend you for the splendid manner in which these charts are being put out.—*W. E. Hoblitzelle, first vice president, Duquesne Steel Foundry Co., Coraopolis, Pa.*

These charts are of much interest to us as they graphically show the trend of business conditions.—*Belmont Iron Works, Philadelphia, Pa., Joseph G. Shoyock, designing engineer.*

Costs Pushing Up Tool Prices

MACHINE tool prices are advancing. With desirable secondhand equipment becoming scarce, the demand for new tools is increasing. Already a number of machinery builders have advanced quotations and consideration of such action is being given by many others. In fact, it generally is expected the machine tool price level will be from six to 10 per cent higher soon.

While orders for new tools have increased greatly in the past few months, they are not appearing in sufficient volume to tax shop capacities. However, production costs have increased to such an extent that higher prices are imperative if the tool builders are to continue in business. The losses suffered by the machine tool trade within the past two years have been enormous and it would be unreasonable to expect the builders to continue to operate at a loss.

Probably the greatest bugaboo to the machine tool trade during the past two years has been the large amount of surplus and used machinery on the market. More than one manufacturer predicted that the machine tool trade would not be able to come back until this class of equipment was removed from the market. Many estimated from three to five years would elapse before this used machinery disappeared. However, from present developments these predictions seem to be unduly pessimistic. There still is plenty of secondhand equipment on the market, but discriminating buyers have discovered it almost impossible to buy the kind of tool that will show an adequate return on the investment, and that when such a tool is found it generally carries a fairly high price. Therefore it is obvious why the demand for new equipment is reviving.

For Revenue or Protection?

PERSISTENT efforts of congress to impose heavy duties on manganese ore and ferromanganese in the pending tariff bill, cannot be justified by economic fact or reason.

The domestic makers who produce ferromanganese for sale conceivably want as much protection as they can get against the competition of British and German makers. As the bill now stands they are to have a duty of $33.60 per ton in their favor, a very tidy amount, considering the fact that ferromanganese today is selling at $67.50 tidewater. However at the same time this very handsome protection is granted, the bill also puts a duty of 1 cent per pound of manganese content on manganese ore. This amounts to something like $20.00 on the quantity of ore necessary to make a ton of ferromanganese. Domestic makers are obliged to use large quantities of foreign high grade manganese ore in order to produce ferromanganese, since the native supplies of suitable ore have never proved themselves commercially adequate.

Apparently those undertaking the framing of the present tariff bill realize that under any conditions large imports of manganese ore are to be expected. While disposed to protect the merchant producers of ferromanganese they cannot overlook the revenue-producing possibilities of the large tonnage of ore imports. In this respect, it is left open to question whether the Fordney bill is a protective or a revenue measure.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

July 5, 1922	June 28, 1922	June, 1922	April, 1922	July, 1921	July, 1913
$37.43	$37.26	$36.96	$34.42	$38.14	$26.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Composite Market Record by Months for Nine Years on Page 68

SCRAP PRICES, PAGE 74, WAREHOUSE, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 70

Iron and Steel Prices

Pig Iron

Bessemer, valley	$25.00
Bessemer, Pittsburgh	26.76
Basic, valley	25.00
Basic, Pittsburgh	26.76
Basic, Buffalo	24.50 to 25.00
Basic del., eastern Pa.	25.75 to 26.25
Malleable, valley	25.00
Malleable, Pittsburgh	26.76
Malleable, Chicago	24.00 to 25.00
Malleable, Buffalo, furnace	24.50
Malleable, del., eastern Pa.	27.25 to 28.25

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	28.63 to 29.64
No. 1X, Buffalo	25.50 to 27.00
No. 2 foundry, valley	24.00
No. 2 foundry, Pittsburgh	25.76
No. 2 foundry, Buffalo	24.50 to 26.00
No. 2 foundry, Chicago	24.00 to 25.00
No. 2 foundry, Granite City	24.50
No. 2 foundry, Ironton furnace	23.00 to 24.00
No. 2 foundry, Cleveland del.	24.50
No. 2 foundry, del., Phila.	26.64 to 27.14
No. 2 foundry, N. J. tidewater	26.63 to 27.76
No. 2X, eastern del. Phila.	27.63 to 28.14
No 2X, east. N. J. tidewater	27.63 to 28.26
No. 2X, eastern del. Boston	29.06 to 30.06
No. 2X, foundry, Buffalo fur.	25.00 to 26.50
No. 2X, Buffalo del. Boston	30.41 to 31.41
No. 2 southern, Birmingham	18.50 to 19.00
No. 2 southern, Cincinnati	22.55 to 23.00
No. 2 southern, Chicago	24.50 to 25.00
No. 2 southern, Philadelphia	24.31 to 24.81
No. 2 southern, Cleveland	24.50 to 25.00
No. 2 southern, Boston	28.65 to 30.15
No. 2 southern, St. Louis	23.67 to 24.17
No. 2X, Virginia furnace	25.50 to 26.50
No. 2X, Virginia Philadelphia	31.24 to 32.24
No. 2X, Virginia Jersey City	31.66 to 32.66
No. 2X, Virginia Boston	28.60 to 30.10
Gray forge, eastern Pa.	25.50 to 27.50
Gray forge, val. del. Pitts.	25.76
Low phos., standard, valley	33.00 to 34.00
Low phos., standard, Phila.	34.79 to 36.79
Low phos., Lebanon furnace	30.00
Charcoal, Birmingham	30.00 to 32.00
Charcoal, Superior, Chicago	31.65

Silvery Iron
8 per cent base

Jackson county, O., furnace	32.50
Tennessee, Chicago delivery	Nominal
Ohio brands, Chicago	37.59

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	41.50
11 per cent	44.80
12 per cent	48.10
13 per cent	$2.10
14 per cent	$7.10

Ferroalloys

Ferromanganese, delivered, Pittsburgh	$72.29 to 74.79
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	67.50 to 70.00
Ferromanganese, 80 per cent, German, c.i.f. Atlantic port	66.00
Spiegel, 19 to 21 per cent furnace spot nominal	35.00 to 36.00
Spiegel, 20 per cent English, c.i.f. Atlantic port	37.75
Ferrosilicon, 50 per cent, contract freight allowed	55.00 to 57.00
Ferrotungsten, standard, per pound contained	40.00c to 45.00c
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	11.50c to 12.00c
Imported ferrochrome, 4 to 6 per cent carbon	10.00c to 10.50c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$8.00 to 8.50
Connellsville foundry	8.50 to 9.00
Pocahontas furnace	5.00 to 6.00
Pocahontas foundry	6.00 to 7.00
New River furnace	6.50 to 7.50
New River foundry	7.50 to 8.00
Wise county furnace	5.50 to 6.00
Wise county foundry	7.00
Alabama furnace	4.50 to 5.00
Alabama foundry	5.50 to 6.00

By-Product

Foundry, Newark, N. J., del.	$10.84 to 12.02
Foundry, Chicago, ovens	11.25
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill., ovens	9.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$35.00
Open-hearth, Youngstown	35.00
Open-hearth, Philadelphia	40.17
Bessemer, Pittsburgh	35.00
Bessemer, Youngstown	35.00
Forging, Pittsburgh	40.00 to 45.00
Forging, Philadelphia	44.17 to 47.67

SHEET BARS

Open-hearth, Pittsburgh	$35.00
Open-hearth, Youngstown	35.00
Bessemer, Pittsburgh	35.00
Bessemer, Youngstown	35.00

SLABS

Pittsburgh and Youngstown	$35.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$38.00 to 40.00
Grooved skelp, Pittsburgh	1.60c to 1.90c
Universal skelp, Pittsburgh	1.60c to 1.80c
Sheared skelp, Pittsburgh	1.60c to 1.80c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	1.60c to 1.80c
Structural shapes, Phila.	1.925c to 2.325c
Structural shapes, New York	1.94c to 2.34c
Structural shapes, Chicago	1.75c to 1.85c
Tank plates, Pittsburgh	1.60c to 1.80c
Tank plates, Philadelphia	1.925c to 2.275c
Tank plates, New York	1.94c to 2.29c
Tank plates, Chicago	1.75c to 1.85c
Bars, soft steel, Pittsburgh	1.60c to 1.80c
Bars, soft steel, Philadelphia	1.925c to 2.125c
Bars, soft steel, New York	1.94c to 2.14c
Bars, soft steel, Chicago	1.75c to 1.85c
Bars, hard steel, Chicago	1.70c
Reinforcing bars, Pittsburgh	1.60c to 1.80c
Bar iron, common, Phila.	1.925c to 2.025c
Bar iron, common, New York	1.94c to 2.04c
Bar iron, common, Chicago	1.80c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.40c to 2.75c
Bands, Pittsburgh	2.40c to 2.75c
Cold finished steel bars, Pittsburgh base	2.00c to 2.25c

Rails, Track Material

Standard bessemer rails, mill	$40.00
Standard open hearth rails, mill	40.00
Relaying rails, St. Louis	23.00 to 28.00
Relaying rails, Pittsburgh	24.00 to 27.00
Light rails, 25 to 45, mill	1.60c to 1.75c
Angle bars, Chicago base	2.40c
Spikes, railroad, Pittsburgh	2.25c to 2.35c
Spikes, small and boat	2.50c
Spikes, railroad, Chicago	2.84c
Track bolts, Pittsburgh	3.00c to 3.50c
Track bolts, Chicago	3.84c
Tie plates, Pittsburgh	1.87½ to 2.12½
Tie plates, Chicago	1.85c to 2.00c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.40c to 2.50c
Plain wire, Pittsburgh	2.25c
Galvanized wire, Pittsburgh	2.75c
Barbed wire, painted, Pitts.	2.50c to 2.65c
Barbed wire, galv., Pittsburgh	3.05c to 3.15c
Polished staples, Pittsburgh	2.55c to 2.65c
Galvanized staples, Pittsburgh	3.05c to 3.15c
C't'd nails, per count keg, Pitts.	1.90c to 2.00c

Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	5.50c
Sheet piling base, Pittsburgh	1.65c to 1.85c
Hot rolled strip steel, Pittsburgh stamping quality	2.50c to 2.75c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.00c to 4.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.15c to 3.40c
No. 28, bessemer, Pittsburgh	3.15c to 3.40c
No. 28, open-hearth, Phila.	3.475c to 3.625c
No. 28, open-hearth, Chicago	3.49c to 3.64c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.15c
No. 28, open-hearth, Chicago	3.49c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.15c to 4.40c
No. 28, bessemer, Pittsburgh	4.15c to 4.40c
No. 28, open-hearth, Phila.	4.475c to 4.625c
No. 28, open-hearth, Chicago	4.49c to 4.64c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.40c to 2.65c
No. 10, bessemer, Pittsburgh	2.40c to 2.65c
No. 10, open-hearth, Phila.	2.725c to 2.925c
No. 10, open-hearth, Chicago	2.74c to 2.84c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	71	58½
1 to 1½-inch, butt iron	44½	29½

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c. l.	53 off
Charcoal iron, 3¼ to 4½ inches, l. c. l.	28 off
Seamless, 4½ and 5-inch, l. c. l.	43 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$50.60
Six-inch and over, Chicago	46.60
Four-inch, New York	58.30
Six-inch and over, New York	53.30
Four-inch, Birmingham	41.50 to 42.00
Six-inch and over, Birmingham	37.00 to 37.50
Three-inch, Birmingham	50.50 to 51.00

Class A pipe is $4 higher than Class B. Standard fittings, Birmingham, base, $100.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

	July 5, 1922	June 1922	April 1922	July 1921
PIG IRON				
Bessemer, valley, del., Pittsburgh	$26.76	$26.96	$22.46	$22.96
Basic, valley, del., Pittsburgh	26.76	26.96	22.21	20.81
No. 2 foundry, del., Pittsburgh	25.96	25.96	22.31	22.06
No. 2 foundry, Chicago	24.50	23.25	20.50	19.35
Lake Superior charcoal, Chicago	31.65	30.00	26.50	36.85
Malleable, valley	24.00	24.20	20.25	20.40
Malleable, Chicago	24.50	23.25	20.50	19.35
*Southern No. 2, Birmingham	18.50	18.50	16.00	20.25
*Southern Ohio, No. 2 Ironton	23.50	23.25	20.30	20.50
Basic eastern del., eastern Pa.	26.00	25.25	21.70	22.25
**No. 2X, Virginia furnace	26.00	24.50	22.60	24.50
**No. 2X, eastern del. Phila.	27.63	27.20	23.60	23.50
Gray forge val. del., Pittsburgh	25.76	25.96	21.96	20.61
Ferromanganese, del., Pittsburgh	72.29	72.82	69.07	75.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	35.00	35.00	31.50	34.00
Sheet bars, open-hearth, Pittsburgh	35.00	35.00	31.50	34.00
Billets, bessemer, Pittsburgh	35.00	35.00	30.10	32.25
Billets, open-hearth, Pittsburgh	35.00	35.00	30.10	32.25
FINISHED MATERIAL—				
Steel bars, Pittsburgh	1.70	1.65	1.50	1.85
Steel bars, Chicago	1.75	1.75	1.60	2.28
Steel bars, Philadelphia	2.025	2.01	1.91	2.15

*1.75 to 2.25 silicon

	July 5, 1922	June 1922	April 1922	July 1921
FINISHED MATERIAL Continued				
Iron bars, Phalidelphia	$1.975	$1.96	$1.86	$2.15
Iron bars, Chicago mill	1.80c	1.74	1.63	1.96
Beams, Pittsburgh	1.70	1.65	1.50	1.90
Beams, Philadelphia	2.025	2.01	1.91	2.15
Beams, Chicago	1.75	1.75	1.60	2.33
Tank plates, Pittsburgh	1.70	1.65	1.50	1.85
Tank plates, Chicago	1.75	1.75	1.63	2.33
Tank plates, Philadelphia	2.025	2.01	1.91	2.15
Sheets, blk., No. 28, Pittsburgh	3.15	3.15	3.10	3.35
Sheets, blue anl., No. 10, Pitts.	2.40	2.40	2.35	2.55
Sheets, galv., No. 28, Pittsburgh	4.15	4.15	4.10	4.35
Wire nails, Pittsburgh	2.40	2.40	2.40	2.80
COKE—				
Connellsville furnace, ovens	8.00	6.60	4.30	2.75
Connellsville foundry, ovens	8.50	7.20	4.95	4.45
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	17.00	17.40	16.35	12.00
Heavy melting steel, eastern Pa.	15.25	15.30	14.35	11.25
Heavy melting steel, Chicago	15.00	14.45	13.55	10.55
No. 1 wrought, eastern Pa.	18.25	17.50	15.85	14.75
No. 1 wrought, Chicago	14.75	14.20	13.25	10.25
Rerolling rails, Chicago	15.75	15.40	14.25	12.45

**2.25 to 2.75 silicon

Basic Iron Sold in Quiet Market

Eastern Pennsylvania Bridge Plant Takes 7500 to 10,000 Tons and Cumberland, Md., Consumer 5000 Tons—Chicago Iron Again Advanced 50 Cents to $1—Southern Iron Firmer After Recent Sales at $18

Chicago, July 3.—Strong demand for pig iron carries the market to $24 for contracts and $25 prompt, Chicago furnace. Inquiry and sales continue brisk. Many orders for carloads for prompt delivery show the need of iron by melters. Tonnage held back for lower freight rates is being released. Shipment in June was larger than for any recent month and July will exceed June. A Chicago melter is inquiring for 1000 to 2000 tons of foundry iron for last half. An Indiana melter asks for 1000 to 1200 tons of malleable for August and September. A recent sale of 1500 tons of foundry was to a Chicago user for third quarter. Buying continues conservatively, strengthening the market, as much for future need is not covered. The Wisconsin Steel Co. is using its entire pig iron production, reducing its merchant tonnage. Superior charcoal is remaining quiet at $28.50 furnace, or $31.65 Chicago. The change in the quotation is on the new freight rate. Silveries are quiet. The Buick Motor Co. bought 1000 tons for last half. The Jackson county schedule prevails. Low phosphorus is $34.35, valley. Inquiry is out for 100 tons for July delivery at Milwaukee. On southern iron most makers are quoting $20 but the Sloss-Sheffield Steel & Iron Co. is quoting $18 to $18.50 for shipment to the Chicago district.

Buys Off Basic Tonnage

Philadelphia, July 3.—The most important pig iron business the past week represented the buying of 7500 to 10,000 tons by a large eastern bridge shop which is unable to get its full supplies from the Pittsburgh district as usual. This interest bought off basic on hand at furnaces and the price paid afforded no indication of the standard basic market. Generally the pig iron market is quiet and sales the past week aggregated only a few thousand tons. The current market on eastern Pennsylvania and New Jersey foundry is $25.50 to $26 base furnace, for No. 2 plain (1.75 to 2.25 silicon), $26.50 to $27 for No. 2X (2.25 to 2.75 silicon) and $27.50 to $28 for No. 1X (2.75 to 3.25 silicon). While some foundry iron still is obtainable at $25 base furnace, it takes a higher freight to this district. Malleable has been sold at $26.50 eastern Pennsylvania furnace. Gray forge has been sold at $25 eastern Pennsylvania furnace. The price of $25 eastern Pennsylvania furnace now is regarded as the current market on standard basic. Sales of 1500 to 2000 tons of copper bearing low phosphorus were made in the past week on the old price basis of $30 furnace. A little business in Virginia foundry was reported last week at $25.60 to $26.50 for No. 2X. Some eastern iron is being sold at material premiums. Some high silicon iron, was sold at $31 eastern Pennsylvania, but such premiums are obtainable only on odd carloads.

Market Report Index

	Prices page	Market page
Weekly Market Review	..	1
Pig Iron	4	5
Coke	4	7
Bars	4	8
Nuts, Bolts and Rivets	70	8
Hoops and Bands	4	8
Ore	70	9
Plates	4	9
Tin Plate	4	9
Scrap	74	10
Warehouse	70	11
Sheets	4	11
Cold-Rolled Strip Steel	4	11
Structural Shapes	4	12
Concrete Reinforcing Bars	4	14
Semifinished Steel	4	10
Merchant and Cast Pipe	4 and 70	14
Ferroalloys	4	14
Cars and Track Materials	4	13
Wire	4	12
Export Market	..	55
British Market (Cable)	21	20
Birmingham Market	21	20
French Market	21	21
Belgian Market	21	22
German Market	21	22
Welsh Market	..	23
Japanese Market	..	23
Coke By-Products	..	..
Machine Tools	45	45

Sales Are Strong

Birmingham, Ala., July 3.—Southern furnace interests willing to take $18.50 for No. 2 foundry are booking large tonnages and the aggregate reported in the week is considerable. Sales are still being made in lots of from 100 to 500 tons at $20. Stovemakers in the Middle West, a few consumers in Philadelphia territory, western railroads, and other eastern

melters have been placing some business in this district. Cast iron pipe interests, radiator makers and other large consumers have been buying steadily and reports are that the third quarter estimated output already is being sold, some extending into the fourth quarter. Reduction of freight rates already has brought about some impetus in delivery. Several consumers have asked for immediate delivery on contracts placed some time back. Belief is that in a few days greater impetus in buying iron will start. The Tennessee Coal, Iron & Railroad Co. has blown in the No. 2 furnace at Bessemer. No. 1 furnace of the Tennessee company at Ensley will be blown in this month and by July 15 the Republic Iron & Steel Co. will have its third blast furnace at Thomas ready for the torch. The Woodward Iron Co. is considering blowing in the second Vanderbilt furnace.

More Inquiries Come Out

Pittsburgh, July 3.—July as well as third quarter pig iron tonnages have become more prominent particularly in steelmaking grades wherein buying has been conservative for some time past. A 5000-ton lot of basic asked by the N. & G. Taylor Co., Cumberland, Md., including 2000 tons for shipment in July, the same amount in August and 1000 tons in September, has been closed at a reported price around $26.50 delivered. The source of the iron is not revealed. Another nearby melter wants 2000 tons of basic for July delivery and the third user 1500 tons of bessemer for prompt shipment. The Mesta Machine Co. recently was in the market for 500 tons of bessemer. The market on both bessemer and basic continues quotable at $25 valley, which according to the compilations of W. P. Snyder & Co., represents the average sales price of those two grades during June. The May averages were $24.40 and $24.91 valley on bessemer and basic respectively. Foundry iron consumers have shown more anxiety over their requirements than steelmaking iron users. While most of the third quarter buying of foundry iron was conducted during May, considerable was done during June as well. One selling interest states that in excess of 12,000 tons of foundry iron has been booked by it for third quarter. The prevailing quotation on No. 2 foundry iron (1.75 to 2.25 silicon) is $24 valley although the $25 valley level is quoted here and there. The National Radiator Co. purchased 1000 tons of foundry in two lots recently for New Castle, Pa., and the Union Radiator Co. entered the market last week for 350 tons. While buyers of malleable claim that they are able to place their orders at less than $25 valley that figure represents the quotable market level on that grade. The A. M. Byers Co. bought at least 300 tons of gray forge recently and a similar amount of low phosphorus iron was purchased by McIntosh-Hemphill & Co. These two grades are quoted at $24 and $34 valley, respectively.

Market Firm; Sales Fair

Cleveland, July 3.—Combined sales of pig iron by the northern Ohio group of furnaces in June amounted to 197,000 tons compared with 184,000 tons in May. The total for the past month has held up well in view of the inability of some makers to sell to the limit in the open market owing to heavy contract obligations and low fuel supplies. Shipments continue in excess of output, and the market remains firm, a rising tendency being noted in some directions. One of the leading sellers booked 10,000 tons in the past week. Included was 1000 tons of No. 2 foundry for a Michigan melter; 1000 tons of malleable for a Michigan foundry; two lots of 500 tons for Indiana consumers and 600 tons for an Ohio buyer. A Buffalo melter is inquiring for 2000 tons of No. 2 foundry; a harvester company at Batavia, N. Y., for 1000 tons of foundry iron for the remainder of the year; from Chicopee Falls, Mass., there is an inquiry for 500 tons of foundry iron, and from Illinois, one for 200 tons. A number of additional inquiries for 200 to 500-ton lots are pending. The inquiry for 4000 to 5000 tons of basic put out several days ago by N. & G. Taylor Co., Cumberland, Md., is reported to have been closed. The leading seller of basic among the northern Ohio furnaces quoted $25, furnace on this business. On the foundry iron sold in the week in Michigan $23, base, furnace, was done, and the company booking the tonnages is quoting $23 to $24, lake furnace, depending on competitive distances. A tonnage of iron is reported to have been offered to a Mansfield, O., melter a week ago at $23, furnace. A company which recently lighted a stack offered iron as low as $23 valley sometime ago but has gone to $24. A Cleveland furnace booked several hundred tons for Canton, O., at $23.50 base, furnace, within the week. It is adhering to this price for business done outside Cleveland. Its price for delivery in Cleveland remains at $24, furnace. A leading valley maker states it would have no difficulty in obtaining $25, provided it had the iron. It estimates sales possibilities in the valley at 100,000 tons. A Cleveland furnace company is preparing to light an additional furnace Aug. 1.

Extended statistics of American and European iron and steel production, exports, imports, freight rates, etc., pages 66, 68 and 72

Sales in Small Volume

Boston, July 3.—Pig iron sales have fallen off in the New England district in the past week. The price situation is firm, however. Activity in the market a few weeks ago has resulted in the accumulation of fairly substantial supplies by foundries in this district. One maker who was selling western Pennsylvania iron at $23 base furnace for No. 2 plain withdrew from the market, insisting that dealers must submit each inquiry. Eastern Pennsylvania iron is quoted at $25.50 for No. 2X. One furnace interest which was to blow out at the end of the month, has revised its plans and is understood to be quoting $27 for No. 2X for July shipment.

More interest is displayed in foreign iron at the moment. It is understood a shipment of several hundred tons from Scotland is on the way and that about a quarter as much French iron. Dealers who are commonly regarded as in a position to know the facts, however, refuse to confirm or deny the statement. It is understood that this iron can be laid down in Boston at about the same quotation as that for southern iron. Inland freights limit the consumption of foreign iron to the vicinity of the ports of entry.

Consumers Are Holding Off

St. Louis, July 3.—Consumers of pig iron in this district are disposed to play a waiting game, pending settlement of labor difficulties in the fuel and transportation fields. While several important melters are known to be in need of tonnages, they are postponing filling their full requirements. A fair volume of scattered buying of small lots for prompt shipment has continued but only where radical price inducements have been made has buying been on a large scale, or for distant delivery. The leading southern producer of foundry iron reports a good volume of sales, aggregating 2250 tons during the past week, and bringing his total for June to approximately 5000 tons. The largest single transaction was 1000 tons to a stove maker in the Belleville end of the district. Another stove plant in the same locality took 200 tons, 175 tons went to a local melter, 300 to a specialty maker in Newton, Ia., 200 to a Kansas City melter, and the balance was in scattering amounts. The major part of the tonnage was for shipment through the second half, and the price was uniformly $18.50 Birmingham. Prices quoted by other southern producers range from $19.50 to $20 per ton.

Northern iron continues firm at $24 per ton, Chicago base. The leading local producer is asking $25.50, f.o.b. Granite City. A local melter has out an inquiry for 350 tons of charcoal iron, and 75 tons of ferrosilicon. All selling agencies report a scarcity of the variety of iron in stock. Activity at the plants continues steadily to increase, and reports at hand indicate an increase in the melt during June of approximately 6¾ per cent over May, and from 45 to 70 per cent over the corresponding month a year ago.

Holiday Checks Sales

New York, July 3.—Interest in pig iron requirements has been falling off during the past few days, due to a considerable extent to the approach of the Fourth of July holiday. Newly reported sales aggregate only a few thousand tons involving mainly foundry iron. A western New York consumer is inquiring for 2500 to 3000 tons of foundry iron for third quarter shipment. A New England consumer is inquiring for 3000 to 5000 tons. Several inquiries ranging from 100 to 500 tons each are out. A lack of the active small inquiry which featured the market recently is shown. Prices are advancing further. A little eastern Pennsylvania tonnage has been sold off stockpiles at $25 for 1.75 to 2.25 silicon, and $26 for 2.25 to 2.75. These prices, however, now are exceptional and the usual minimum prices on eastern Pennsylvania and New Jersey

foundry are $25.50 to $26 furnace, for 1.75 to 2.25 silicon; $26.50 for 2.25 to 2.75 and $27.50 for 2.75 to 3.25 silicon. In some special instances the latter prices have been shaded 25 cents. The Buffalo market reflects a stronger tone and it appears the present minimum on Buffalo foundry is $24 base furnace, plus 50-cent differentials. Prices on central Pennsylvania iron are moving up and now range from $25 base furnace, upwards. Some moderate sized lots of central Pennsylvania 2.25 to 2.75 silicon have been sold at $27 furnace. Lake Superior charcoal iron has been sold at the new prices of $28.50 furnace. Some moderate sized lots of copper-bearing low phosphorus iron have been sold at $30 furnace.

Prices Nearly Uniform

Buffalo, July 3.—With the exception of one furnace interest, quotations on prompt and forward iron in this market are all at the $25 base. The one lower quotation is $24.50 for No. 2 plain (1.75 to 2.25 silicon). A furnace which withdrew temporarily, is quoting again on a $26 basis. One interest reports inquiries of 5800 tons including one lot for 1000 tons and three for 500 tons. Other inquiries were for 200 tons and less. Other furnaces have sold smaller tonnages. A report of low priced iron coming out of Buffalo district may originate with the fact that a local furnace sold some high sulphur metal at $23 during the week, but announces that any foundry iron which it has to sell, which is very little, would be on the $25 basis. At $26 base, the range is up to $26.50 for 2.25 to 2.75 silicon; $27 for 2.75 to 3.25 and $28 for 3.25 to 3.75. Malleable is $24.50 to $26. The coke situation is hampering furnace operation. Some furnaces are not being operated at full production. Another furnace will be placed in blast here this week.

Southern Iron Is Firmer

Cincinnati, July 3.—While there has been a suspension of business in the pig iron market over a four-day holiday period, this was preceded by considerable activity in which consumers showed a disposition to place third and fourth quarter orders. Major tonnage moved during the past week was southern iron. Furnaces in the southern Ohio district still are holding back and are accepting only such tonnage as is offered at firm prices. The market shows a tendency toward firmness following a reactionary movement last week occasioned by a break in prices by three southern furnaces which are reported to have unloaded practically all the iron they set out to dispose of at $18 base. With one single exception southern furnaces now are reported on a Birmingham base of $18.50 with some producers quoting $20 against all inquiries. But little Ironton district iron appears to be available and the market is firm although the claim made in some quarters that it is on a $20 base, scarcely is substantiated by order book records. However, only a limited tonnage is moving and makers generally are quoting $23.50 to $24, Ironton. So far no particularly attractive inquiry has developed. Generally a revival is expected soon after the holiday period.

Coke Continues Upward

Steadily Rising Prices for Available Tonnages Quoted in Consuming Centers—More By-Product Material Taken by Furnaces

COKE PRICES, PAGE 4

Pittsburgh, July 3.—Additional by-product coke has been sold for blast furnace use in place of beehive. The latest purchase of by-product coke involves approximately 5000 tons, and it is understood that more than $10.50, delivered, was obtained for it. The maker has been furnishing by-product coke to the Weirton Steel Co. and other large buyers but had this much free coke for sale. Much of the Connellsville beehive coke that is being produced is high-sulphur nonmetallurgical coke while the remainder, standard 48-hour fuel, is being furnished to regular blast furnace customers on contract. Other operations put out three or four cars every two days, relatively unimportant tonnage. While it is reported that as high as $9 has been paid for furnace coke this probably was done by eastern gas and electric companies which have had their sources of anthracite coal cut off. Several blast furnaces sought to buy when the 48-hour fuel advanced higher than $7.50, but this grade cannot be quoted this week at less than $8 to $8.50. Several large coal mine operators are planning partial resumption within the next week, taking back those men who have stated their willingness to work under proper protection. Selected 72-hour fuel is quotable at $8.50 to $9 and $9.25 is being named in certain directions. As high as $9 recently has been paid for lots of beehive foundry coke involving one to 10 carloads each. Production according to the *Connellsville Courier* for the week ended June 24 was 68,050 tons as compared with 66,850 tons the preceding week.

Supplies Quickly Taken

Cincinnati, July 3.—The available tonnage of coke in this market is lower perhaps than ever before. The few cars that come in from time to time are taken practically without regard to price. Connellsville and Pocahontas, furnace and foundry goods, cannot be had, and nearly all Wise county stocks have been absorbed. Limited tonnage of New River foundry is available. There has been heavy buying of by-product coke throughout the district. An advance of $7.50, ovens, has been announced by by-product makers at Ashland, Ky.

Stocks Holding Out

S. Louis, July 3.—June, the third month of the coal strike, was weathered in this district without stringency being felt by consumers of coal and coke. The end of the month found reserve stocks of all kinds considerably reduced, but still sufficient for 30 days or more. The trend of prices for coal and coke is upward. Connellsville 72-hour foundry coke is quoted at $8 in open-top cars and $8.25 in box cars. Little coke from that district or other eastern points is arriving, melters relying largely on by-product coke. By-product prices are up 50 cents on furnace and foundry grades and $1 higher on domestic sizes, effective July 1. Many users postponed buying in hope of better prices after July 1 because of the lower freight rates, but this advantage is more than offset by the advance asked by the ovens. Southern coke is offered in small amounts at $5 to $5.50, Birmingham.

New England Prices Advanced

Boston, July 3.—Coke prices have been advanced again by the leading producer of by-product coke in New England, following the advance of last week. Effective July 1 contract coke is $13.50 per net ton, and for spot shipment, $14.50. For points outside New England the rate is $12 a ton. Many coke contracts were closed toward the end of June for delivery in the last half of the year.

Prices Continue Upward

New York, July 3.—Prices of foundry coke continue to mount rapidly. Current buying is of an emergency character and there is sufficient demand to absorb all the tonnage that is to be had. Dealers in numerous instances have been unable to locate coke to sell to regular customers. Business in standard beehive foundry coke during the past few days has been done at prices ranging for $8 to $9.50, Connellsville. It is exceedingly difficult at present, however, to get anything under $9. On blast furnace coke the market is nominal, since there have been no transactions. On one lot of furnace coke for prompt shipment, $9.25, Connellsville, was quoted. The Seaboard By-Products Coke Co. is sold up and is practically out of the market. This interest is producing at capacity. Its price continues on the basis of $10 f. o. b. ovens, for by-product foundry coke, which owing to the reduction in freight rates now is equivalent to $10.84 to $12.02, delivered, Newark, N. J.

Foundry Prices Vary Considerably

Philadelphia, July 3.—Foundry coke prices show considerable variation in sales made in this district in the past week. All the way from $8 to $9.50, Connellsville, was done. It is difficult to locate any tonnage now under $9. Several lots of 5 to 10 cars each of furnace coke have been purchased by gasworks at $8 to $9, Connellsville. The only business closed by blast furnaces involves some prompt tonnage at $8 to $8.50, Connellsville. Some furnace coke now is under negotiation.

Starting More Ovens

Birmingham, Ala., July 3.—Coke sales in the Birmingham district are better. Foundry coke is being sold at $5.50 ovens as a minimum, and some sales are noted at $6. Pitch coke is selling at $10. Furnace coke is $4.50 to $5.00. Alabama coke is being shipped to the Middle West.

Bar Users Offer Premiums

Consumers Anxious for Tonnage for Prompt Delivery—Practically All Producers Are Sold for Third Quarter—Prices Firm

BAR PRICES, PAGE 4

Chicago, July 3.—Soft steel bars have been in such strong demand that practically all producers are sold for the entire third quarter and in spite of every effort to produce at fullest capacity, little effect is being wrought on the backlog. Bars have been the strongest finished steel product and every plant producing this material is operating its bar department at full capacity, regardless of short operation in other mills. A range of 1.75c to 1.85c, Chicago mill, is being maintained. Automobile producers have been in the market for considerable material and agricultural implement makers are also seeking bars for their fall program, although the latter interests are not buying as heavily as usual.

Bar iron has been advanced $1 per ton to 1.80c, Chicago, on good demand and somewhat shortened production. Some mills have as much as they can accommodate, while others still are able to take further tonnage. Conditions as to fuel and labor render the situation uncertain.

Hard steel bars are more active than was the case earlier in the year and additional production will be put in within a short time. This market is steady at 1.70c, mill.

Negotiations Fairly Numerous

Pittsburgh, July 3.—Merchant steel bars have been sold at 1.80c, base Pittsburgh but 1.60c still is the minimum since some contracts on that basis are unfilled. However, 1.70c to 1.80c is more representative of the market. Deliveries are far behind. Some third quarter contracts for 100 tons or more have been negotiated, but so far as can be learned independent producers are not naming anything below the 1.70c figure. Cold-drawn steel bar finishers, nut and bolt makers and other users all have been active either in the way of furnishing specifications against contracts or in seeking to extend present tonnages on the books of makers.

Demand for refined iron shows but little improvement; small lots are being produced from time to time with an occasional carload order or more. Buyers continue their policy of purchasing material just as needed. From 2.15c to 2.20c are the prices being quoted on refined iron with 4.00c still applying to low phosphorus melting bars as well as double refined iron bars.

Premiums Are Offered

New York, July 3.—The extent to which the commercial steel bar supply is sold up is illustrated by the fact that a number of consumers during the past few days have been offering to pay premiums of $1 and $2 a ton on carloads for spot shipment. While several mills have declined these offers due to the fact that they are unable to make the delivery, the business has been accepted by others. The market may be quoted at 1.70c to 1.80c base Pittsburgh. As far as known, there has been no business under 1.70c. Demand for forging bars continues active and the minimum price appears to be 2.00c, base Pittsburgh.

Consumers Offer Premiums

Philadelphia, July 3.—No letup in demand for steel bars is seen and consumers in many instances are anxious to pay premiums for prompt delivery. An increasing proportion of new business is going at 1.80c, base Pittsburgh. The current market ranges from 1.70c to 1.80c and there is practically no indication that 1.60c can any longer be done, particularly for nearby shipment. Mills are operating at about 75 per cent of capacity which is the maximum possible under present fuel conditions.

More Tonnage Than Accepted

Cleveland, July 3.—Steel bars continue the most active form of finished material and more tonnage is being offered to the larger mills than they care to accept. Deliveries remain extended for from four weeks to 90 days, depending on sizes. Some further signs of an expected slowing down of automobile activity in the summer months are reflected in the forward ordering of bars by specialty manufacturers. The price situation is firmer and while 1.60c, base Pittsburgh, is still a market possibility, 1.70c is the more usual quotation.

Cold-Drawn Price Strengthens

Pittsburgh, July 3.—The price of cold-drawn steel bars continues to strengthen. As makers get to a point where 1.60c and 1.70c merchant steel bars have to be utilized, they are getting away from the 2.00c, base Pittsburgh level. At least one large producer, however, still is maintaining that as a minimum. The majority are on a 2.10c base minimum as indicated last week and from there up to 2.25c is being quoted. The automotive industry still commands the major portion of makers' attention. The anticipated quiet automotive period during the hot weather is expected to afford the cold-drawn finishers a wanted opportunity to attend to the needs of other industries more thoroughly since the cold drawn bar consuming field has improved generally. The producing end is operating almost to capacity although it is interfered with slightly by a labor shortage here and there and poor deliveries of steel from the mills.

Bolt, Nut, Rivet Orders Large; Prices Firm

NUT AND BOLT RICES, PAGE 70

Pittsburgh, July 3.—Jobbers as well as large users continue to order nuts, bolts and rivets in fair lots. Several contracts for 100 tons or more have been noted. Against these latter, specifications are being issued from time to time. In connection with rivets, the general specification is 18 or 20 tons, a minimum carload consisting of 180, 200-pound kegs. Those producers who are operating with gas for fuel are on a 90 per cent average basis while those who depend upon coal are somewhat hampered and still continue around 80 per cent of capacity. For the most part, the recently inaugurated higher prices are fairly firm.

Higher Bolt Prices Near

Chicago, July 3.—Prices of bolts and nuts are likely to be advanced shortly and in some cases quotations are being made at a higher level than the present schedule, although the market generally is on the present discount basis. Buying is improving and many consumers have placed contracts for their third quarter requirements. A number of producers have an excellent backlog for third quarter and are beginning to choose business as it is offered. Selling into fourth quarter has not been undertaken.

Specifications Are Heavy

Cleveland, July 3.—Orders for bolts and nuts continue liberal with makers in this district. During the past week specifications have been extremely heavy due to the ending of the second quarter. Considerable third quarter business is being placed and while individual orders are only of moderate size in the aggregate considerable tonnage is represented. Prices are firm at the recently established levels. Nut and bolt plants here are maintaining operations at a high rate. Operations generally average from 75 to 85 per cent although a number of plants are at 100 per cent. Inability to obtain prompt fuel and steel shipments are hindering some plants in increasing production.

Rivet demand continues steady. Considerable third quarter business has been placed at the prevailing price levels, namely, 2.40c and 2.50c, base Pittsburgh, for structural and boiler rivets respectively. These prices are being firmly maintained.

Some Bolt Prices Shaded

Philadelphia, July 3.—Demand for bolts, nuts and rivets continues to increase and the prices recently inaugurated are being better maintained. On bolts the usual discount of 60 and 10 off is being held on the large size as a rule, although in some instances where orders are unusually attractive, 60 and 10 and 5 to 65 and 5 off, has been done. There is little shading of nut quotations reported. Rivets are being quoted 2.40c, base Pittsburgh, on structural and 2.50c on boiler. Most of the rivet business being placed is of small and moderate sized orders.

Band Prices Tend Higher

HOOP PRICES, PAGE 4

Pittsburgh, July 3.—Hot rolled flats in the narrow sizes and thin gages as produced by the hot-rolled strip steel manufacturers are now firm upon a minimum of 2.50c, base Pittsburgh. From there up to 2.75c is being quoted. Some hoop and band producers still are quoting the 2.50c level, however, so that the full spread of the market

is 2.40c to 2.75c, base Pittsburgh. Fair orders are being taken and while the usual purchase or specification on contract involves a single carload or two at a time, occasionally a larger tonnage is closed. Some commitments run as far as three months ahead but users are asked to confine their buying to 60 days' requirements.

Tin Plate Buying

Is Limited But Unfilled Orders Are Heavy—Shipments Near Record

TIN PLATE PRICES, PAGE 4

Pittsburgh, July 3.—Unfilled orders for tin plate are heavy but new buying is of rather indifferent proportions. Outside of a few large orders, expected within the next few weeks from certain canmakers, new business will be limited from now on until after Aug. 31. For a certain group of independent mills operating less than 300 hot tin mills, unfilled bookings on June 1 were approximately 3,500,000 base boxes, so that approximately 90 days' work is ahead. This is more or less typical, and present high operating rates, 100 per cent with many independent makers, can continue for some time to come. The first half of the year 1922 was the third largest in the history of the American Sheet & Tin Plate Co. as regards shipments. Apparently the preponderance of its hot mill output was tin plate during that period since while in sheets it was the fourth best first-half year, in its entire production the six months just ended being the third best since it has been in business. This past week the operating average of the leading interest has been around 78 per cent but the present week will witness considerable of a drop with it as well as with independent producers due to the celebration of the Fourth which will in many cases extend over a longer period than the second and third day of the week. Perhaps no more than 50 per cent of production will be possible of attainment in many hot mills. The $4.75 price per base box of 100 pounds, Pittsburgh, continues firm with most of the independents and with the leading interest.

Mining Activity Grows; Coal Supplies Ample

Duluth, Minn., July 3.—The Oliver Iron Mining Co. and the independent producers are increasing mining operations on the Minnesota ranges. The Oliver company is working the Hull-Rust mine with a full force. The Mahoning Ore & Steel Co. has started shipments from the Mahoning mine. Pickands, Mather & Co. have opened the Utica and Albany mines. The Rogers, Brown Ore Co. expects to ship a heavy tonnage from the Susquehanna mine. The Shenango Furnace Co. has opened the Webb mine. Large additional forces of miners have been put to work on the ranges during the last 10 days. Fourteen steamers cleared with ore from the docks here June 26. A fleet of 65 steamers is reported enroute for ore, 40 bound for the Great Northern docks at Superior and 25 for the Missabe railroad here

Plate Price Is Stronger

Minimum Now Offered by Leading Interest 1.70c, Pittsburgh—Conditions in Consuming Lines Best in Two Years

PLATE PRICES, PAGE 4

Philadelphia, July 3.—The plate market here is fast developing strength. At least two contracts for the third quarter for boiler and tank plates, including some of large dimensions, were booked in this district in the past week at 1.95c, base, Pittsburgh. Some third quarter business was closed at 1.80c and 1.85c. Other business was done in the week for nearby shipment at 1.60c, base, Pittsburgh, but this figure is exceptional and 1.70c is the usual minimum. Considerable inquiry is before the trade including tonnages for a variety of purposes. Conditions in all consuming lines now are the best in two years. There has been no tendency to stop buying around the Fourth of July holiday. One platemaker reports orders better today than those for any previous day in a long time. The Chesapeake & Ohio railroad purchased several hundred tons of plates, shapes and bars. Inquiry is out for good tonnages for gas holders. No action has been taken on two boats for the Eastern Steamship Co. on which the Bethlehem Shipbuilding Corp. is low bidder. Bids were re-opened last Thursday on three vessels for the Ocean Steamship Co. and a fire boat for the city of New Orleans. Most of the current plate inquiry includes small or moderate lots mainly for prompt shipment. Large specifications were received last week on second quarter contracts.

1.70c Is Minimum Price

Cleveland, July 3.—Stronger prices are in evidence in this territory. The minimum figure now being named by the leading producer is 1.70c Pittsburgh and the 1.60c figure no longer is being heard of except in the case of old protections. It is apparent that the latter are not to be left open much longer, particularly those in the case of pending vessel contracts on the lakes. Some makers continue to quote up to 2.00c Pittsburgh. Business is in fairly good volume. About 1000 tons for stills for Standard Oil Co. subsidiaries remain pending.

Cars Take Many Plates

Chicago, July 3.—Mills rolling steel plates are receiving heavy specifications from carbuilders for material already on books. The construction of freight cars is being pushed to capacity. This assures full operation of plate mills as a large unspecified tonnage of plates is still on books. The Inland Steel Co. is able to give six to eight weeks delivery on steel plates and is quoting 1.80c, Chicago, while the Illinois Steel Co. maintains a spread of 1.75c to 1.85c, mill.

1.80c Orders Not Numerous

Pittsburgh, July 3.—Orders for plates at the 1.80c figure recently announced by some large independent producers are not numerous but some lots are being placed at that level. That figure has applied during the past week to such lots as 100 or 120 tons for prompt shipment. Other lots of plates are being billed at lower prices, namely 1.60c to 1.70c since some unfilled contracts carrying those figures still are being specified against. Tank work here and there, railroad car and locomotive work as well as river barge and vessel building activity all contribute to the tonnages being negotiated. The chief difficulty of producers is to keep commitments in line with their production ability.

Price Firm; Orders Small

Boston, July 3.—Plates are a shade stiffer in this market, with several sales reported for the past week at 1.80c, base Pittsburgh. A few mills are lower but the market now appears to be fairly firmly established at the higher basis. Only shipments on old commitments at 1.70c are being made. No large inquiries are in sight. Most of the orders are for carload lots.

New Iron Ore Demand Simmers Down

ORE PRICES, PAGE 70

Cleveland, July 3.—Less activity is noted in the market for iron ore, due to the fact that the majority of consumers have closed for their requirements. One of the leading sellers has inquiry pending for several hundred thousand tons. This interest has sold 300,000 tons of lump ore for use in open hearths as "fix," and a considerable tonnage of fine ore also has been sold for use in puddling furnaces. No sales have been made in the East this season aside from those involving special grades of ore.

Some shippers report an increase in tonnage named in shipping instructions received from furnaces, due to the lower railroad freight rates. Others say it is difficult to get buyers to decide definitely what tonnage they will take on contracts this year, and this uncertainty is causing some uneasiness on the part of vesselmen.

Shipments from the head of the lakes in June amounted to 6,629,711 tons, compared with 3,609,989 tons in June, 1921. The total for this season to July 1 is 8,351,177 tons, compared with 6,371,227 tons for the corresponding period last year.

Buying Port Henry Ore

New York, July 3.—Substantial tonnages of Port Henry iron ore have been purchased by eastern blast furnaces since the announcement of price reductions June 12. More interest is manifested in ore requirements at present than in two years past. While there is considerable ore on hand it is expected additional tonnage will be placed, especially for mixing purposes.

Scrap Activity Continues

Buying Is Varied with All Grades Moving in Some Districts—Quietness Prevails on Some Materials—Consumers Name Lower Prices

SCRAP PRICES, PAGE 74

Chicago, July 3.—Additional strength is being shown in the scrap market, and a general advance of 25 cents to $1 per ton was made recently. This is due to strong fundamental conditions and also to the advanced level of pig iron. Steel grades are dull, and while $16 has been asked for heavy melting steel, $15.50 has been bid, which is above the prevailing level. Comparatively little steel scrap is moving, although some dealers have fairly large short sales yet to cover. Outside of scrap yards there is some shortage of prepared heavy melting steel and both interests in the market appear to be waiting developments. Rolling mill grades are in much better demand as bar iron mills increase their production. Low phosphorus scrap is in considerable demand and is assuming a higher level. A recent bid by a user, in seeking to buy some low phosphorus shell forgings, assisted in strengthening the market. Railroad offerings are practically absent, but a larger tonnage from this source is expected.

Borings and Trimmings Taken

Boston, July 3.—Fairly large shipments of mixed borings and turnings are reported by dealers in this district this week, with estimates of the total transactions ranging up to 3000 tons. Wrought pipe prices are lower with sales at $7.75 but this evidently is due to the satisfaction of the demand from the principal mill in this district which is now well booked. Inquiries are small, the most notable one being for a Portland, Me., mill which is seeking some car axles, tonnage not stated.

Holiday Affects Buying

New York, July 3.—Holiday dullness has settled over the scrap market and few sizable tonnages are being placed. However, fair quantities of heavy melting steel are going to the Bethlehem Steel Co. and the Alan Wood Iron & Steel Co. in the East and to the Weirton Steel Co. and the Pittsburgh Steel Co. in the Pittsburgh district. Buying in cast scrap noted in substantial volume recently, has subsided. The revision in freight rates July 1 has had little effect on prices, the market remaining virtually the same.

Buyers Lower Price Ideas

Pittsburgh, July 3.—Scrap buyers with stocks on hand are lowering the prices at which they will buy. One consumer near Pittsburgh which has been paying $14.50, $16.25 and $18.75 for machine shop turnings, cast iron borings and heavy breakable cast, respectively, states it is now out of the market except at $14, $16 and $18, resnectively. In connection with heavy breakable cast, on one lot of 500 tons sold in this district recently $19.50 applied but this grade again has dropped to $18 to $18.50. No additional buying of cupola cast or cast iron car wheels is noted. Sellers are strong at the levels recently quoted. Railroad scrap lists generally are smaller this month than last but it is thought that lower bids will prevail.

Greater Demand Noted

Buffalo, July 3.—The better trend noticed in the scrap market the latter part of last week is continuing with a more brisk demand for all grades. Mills are again soliciting tonnage and dealers have assumed a stronger price position. Most of them are asking $17 for heavy melting steel. Borings are strong and the outside demand is forcing local consumers to pay higher prices. Car wheels are being sought for outside shipment, Pittsburgh paying $21 to $22 for them. Production of scrap in the district has improved.

Some High Marks Reached

Detroit, July 3.—Generally upward was the trend of the scrap market last week, several items going to higher levels than in several months. Cast borings went over $11 for the first time in some weeks. Wrought iron

(Continued On Page 17)

Wire Rod Sales Strong

Substantial Tonnages Sold in East at $42—Forging Billets Booked at $42.50, Pittsburgh—Less Activity in Sheet Bars

SEMIFINISHED STEEL PRICES, PAGE 4

Pittsburgh, July 3.—Inquiries for billets, except for those of forging quality, are scarce. Without much basis in actual transactions, the 4 x 4-inch rerolling billets are quoted firmly at $35, Pittsburgh or Youngstown, with $37 applying on the smaller sizes. Makers do not have much tonnage to offer. Higher prices are being obtained on forging billets, one independent producer receiving $45 on one heat recently. A few days ago the same maker disposed of 500 tons for slightly extended delivery at $42.50. The market for sheet bars would be active if bars were available. This is particularly true of bessemer steel bars. Deliveries are far behind. Some second quarter contracts will be carried over into the third quarter with prices in many cases less than $35, Youngstown, which is the nominal market quotation. The Apollo Steel Co. is understood to have purchased a round tonnage from an independent Pennsylvania steel company at $35, f.o.b. mill. Mill prices fast are superseding Pittsburgh or Youngstown base prices and it is doubted if $37.50, Youngstown, would be acceptable to producers in that territory for either prompt or extended delivery. The Carnegie Steel Co. is said to be so heavily committed on sheet bars that it cannot take additional tonnage for July. South Chester Tube Co. is encountering difficulty in locating 1000 or 2000 tons of skelp. Around 1.80c is considered the nominal market on skelp. Some producers are disinclined to take any business at that or a 2.00c base figure.

Wire rods are quoted at $40 by the American Steel & Wire Co. and some independents, although $38 still is retained as the market's minimum as there are still some rods committed at that figure. As high as $43 is talked of as a satisfactory price at which to sell.

Wire Rods Active

New York, July 3.—Demand for wire rods continues active and consumers in some instances are having difficulty in placing tonnages. Makers have so much use for the rods in their own finishing departments that they are unable to spare much tonnage. Due to the coal situation, production has been smaller for the past two months than it would have been. Some wire rod business has been done during the past week at $38, base Pittsburgh, but this figure no longer is a factor. It is beileved nothing under $40, base Pittsburgh, now could be done. Demand for billets has been restricted to small tonnage. The billet market is quoted at $35, base Pittsburgh, for open-hearth rerollers and $40 for forging billets. Some makers now are asking $42 for forging billets.

Books 7000 Tons

Cleveland, July 3.—Less interest is noted in semifinished material in this market, though the leading maker here booked 7000 tons of sheet bars, billets and slabs in the week all at $35. It continues to book at this price for third quarter. Prompt tonnage still is available at the same figure.

Eastern Prices Advancing

Philadelphia, July 3.—Prices of semifinished material are advancing due to the fact that mills are less able to spare tonnages owing to demands from their own finishing departments. From 700 to 800 tons of forging billets were sold in the week at $42.50, base, Pittsburgh, which is an advance of $2.50 over anything done previously. Wire rods were sold in substantial tonnages at $42, base, Pittsburgh. They are scarce and consumers show no disposition to insist on lower prices. No sales of rerolling billets or sheet bars are reported and these are quoted nominally at $35, base, Pittsburgh.

Few Inquiries Are Current

Youngstown, O., July 3.—No inquiries for billets, slabs or sheet bars are current this week in this district. An eastern tin plate maker recently inquired for several hundred tons of sheet

bars upon which $35, Youngstown, was quoted. It is understood this requirement now has been shelved in view of the consumer's inquiry for several thousand tons of basic iron. The market price of sheet bars for the remainder of third quarter appears to have hardened at $35, Youngstown. Most of the sheet bar tonnage on makers' books here was taken at this figure for delivery this month only. Mills are scheduled tightly for this month's sheet bar rolling.

Warehouse Price Changes Are Awaited

WAREHOUSE PRICES, PAGE 70

Philadelphia, July 3.—Jobbers of iron and steel materials in this district as yet have not made adjustments in their prices to accord with reductions in freight rates. When they are made, however, they will correspond with the reduction of from 36 cents to 32½ cents in the rate on finished material per 100 pounds, from Pittsburgh to Philadelphia. Local interests, however, will make no change until the Steel corporation changes prices from its Waverly warehouse and Joseph T. Ryerson & Son, makes changes on shipments from its Jersey City, N. J., warehouse. Demand out of stock has improved considerably.

Demand Continues Large

Cleveland, July 3.—Demand for iron and steel materials out of stock continues good. The Carnegie Steel Co. warehouse here reports that demand in June was in excess of that in May, which month was the best it had experienced in more than a year. All classes of material are in demand with structural shapes, galvanized sheets and bars being taken in the larger tonnages. Prices are unchanged.

Strip Price Is Advanced

STRIP PRICES, PAGE 4

Pittsburgh, July 3.—Hot-rolled strip steel registered an advance of $2 per ton June 29, going from a minimum of 2.40c to 2.50c, base Pittsburgh. Some makers anticipated this increase by one week, inaugurating the higher level on June 23. From 2.50c to 2.75c now is being quoted. Present hot-rolled commitments in no case go beyond Sept. 30 and the majority are for shipment during July and August. From a single carload up to 500 tons at a time are involved in orders booked. As is true of hot-rolled, most of the orders for tonnage in cold-drawn are furnished by the automotive and allied industries although other consumers are specifying freely. Cold-drawn steel is firm and with most manufacturers present high operations of approximately 80 per cent of capacity are possible for 90 days to come. Some contracts recently taken are for customers' third quarter requirements while others are for shipment in October and thus the fourth quarter already has been entered. The minimum of the market is firm at 4.00c, base Pittsburgh, and a limited tonnage is being taken at 4.25c.

Sheet Deliveries Lagging

Mills Now Six to 12 Weeks Behind on Deliveries—Diversified Demand Continues Strong—Motor Car Makers Seeking Larger Tonnages

SHEET PRICES, PAGE 4

Pittsburgh, July 3.—Due to the hot weather, labor shortages, box car shortages and other causes many sheet mills are behind on deliveries 6 to 12 weeks. Black sheet deliveries are in some cases six to eight weeks deferred while even longer periods must elapse for deliveries of galvanized. During the hot weather it is extremely difficult to retain skilled and unskilled labor in the hot mills, particularly in the pickling and galvanizing departments. In order to relieve the men as much as possible when it is so difficult to roll thin-gage sheets, some producers request their customers to specify at least 50 per cent of 22 and 24-gage and heavier material along with the 28-gage and lighter sheets, since if all orders were for the latter they could not retain the men to run the mills. Demand is at a high peak and shows no signs of interruption. The present buying is diversified. Large orders are being placed by automobile manufacturers. The latter are resorting to every means within their power to obtain quicker deliveries and more tonnage. Some of them have been told that additional specifications can only be taken for delivery next November and December, enough orders now being on the books to last through September and into October. Large makers have accumulated heavy backlogs of business. The buyers who did not foresee the huge automotive demand probably will find themselves up against a sheet shortage. One Michigan producer has increased its schedule to produce 350 instead of 50 cars daily and wishes to make 500 cars daily. By personal solicitation, mail and telegram, it is endeavoring to purchase the needed steel. Except in one or two cases independent makers are on a higher level as regards prices than the American Sheet & Tin Plate Co. whose prices are 2.40c, 3.15c, 4.15c and 4.50c for blue annealed, black, galvanized and full-finished automobile sheets, respectively. For black sheets 3.30c, 3.40c and even 3.50c are being named by certain makers, with other grades priced accordingly.

Books Annealed at 2.60c

Philadelphia, July 3.—The sheet market here reflects a firmer tendency. One eastern independent mill last week announced a minimum price on blue annealed of 2.60c, base, Pittsburgh, and it has booked considerable tonnage at this figure including lots for prompt shipment and for third quarter. Prices continue to show considerable spread. Some independents are meeting the leading producers' prices of 2.40c, base, for blue annealed; 3.15c for black and 4.15c for galvanized. However, the tendency of these independents is to obtain 2.50c, 3.30c and 4.30c, respectively, on current business and to quote lower figures only on more attractive tonnages. The market in the past week was active as consumers entered at the last minute for shipments of tonnage remaining on second quarter contracts. New business is not large but there is an increasing demand for protection.

Mills Turn Down Inquiry

Chicago, July 3.—Sheet mills in the Chicago district are sold through the third quarter. An independent mill has been unable to take anything further. Present bookings in general will run mills into fourth quarter. Producers do not care to book business beyond the third quarter at present prices. While the leading producer maintains its lower schedule, a nominal range of $2 to $3 higher is named by the independent mill. As the latter is unable to take business the prices have little significance.

Prices Show Wide Spread

Youngstown, O., July 3.—Equipment will be repaired this week while four of the valley sheet plants are down. The remaining four plants will resume operations Wednesday. Demand for all grades of sheets is good, particularly for black, galvanized and full finished. In some cases as high as 4.00c, Pittsburgh, is asked for August delivery on No. 28 black. In other instances 3.50c, Pittsburgh, is quoted. Generally, however, the market price centers at 2.65c for blue annealed, 3.30c for black and 4.30c for galvanized, base gages, Pittsburgh. Some mills have met the United States Steel Corp.'s prices of 3.15c and 4.15c on limited tonnages of black and galvanized. Others are understood to have taken tonnage of these grades at 3.25c and 4.25c, respectively. Most mills are covered for this month's output and have considerable rolling scheduled for August. Fine finished sheets command 4.75c base, Pittsburgh, although no tonnage is available for this quarter from makers here. Motor car builders in Detroit say their sales are surpassing those of previous years. Sheet mill by-products such as mill warmers, wasters, cutdowns, etc., are scarce. Seconds, one-pass, cold rolled are being held at $40 a ton. This price appears out of line with those at which prime stock can be purchased although few sheets of this grade are offered.

Elects New President

Directors of the Consolidated Iron & Steel Corp., St. Louis, Mo., have elected J. R. Finklestein, president of the Hoosier Rolling Mill Co., Terre Haute, Ind., president. Other officers are: Chairman, F. J. Stuart; first vice president, Hugh Ferguson who formerly was president; vice president and treasurer, E. J. Schroeder; and secretary, M. C. Walsh. The company has plants and properties at Terre Haute, Steelton, Ind.; Mountain Home, Ark.; and Stuart, Williamsville, Chapin, Brandsville and Carson, Mo. B. G. Slining is chief engineer and J. P. Marshall is superintendent of furnaces.

Big Jobs Feature Shapes

Niagara Falls Bridge, 8000 to 10,000 Tons, About To Be Placed—9000-Ton Power Plant Pending—Mills and Fabricators Busy

STRUCTURAL SHAPE PRICES, PAGE 4

New York, July 3.—Structural demand continues active, with the outstanding inquiry that of the Brooklyn Edison Co., calling for 9000 tons for new power plant. Bids will be closed in about 10 days. In addition there is an unusually large number of small jobs, ranging around 200 and 300 tons each. A leading award calls for 3000 tons for telephone exchange in Brooklyn. Action is expected this week in the award of 8500 tons for the county court house, the George A. Fuller Co., as reported last week, having the general contract. Interest is manifested in plans for a new post office, involving several thousand tons, although figures will not likely be brought out for considerable time.

Prices continue to tend upward. While 1.70c, Pittsburgs, is the generally accepted market on shapes, higher is being quoted more frequently, especially where early deliveries are desired. Fabricated material may be quoted approximately as follows: On lofts, $73 to $78; offices, $75 to $80; apartments, $78 to $85.

New Business Larger

Cleveland, July 3.—A larger aggregate of new structural business has come before the fabricators and the mills from the Cleveland and surrounding districts. Bids for the Miramar apartments, 1600 tons, have gone in and miscellaneous new business aggregates several thousand tons. On a large Michigan Central railroad bridge at Niagara Falls, 8000 to 10,000 tons, bids on which went in the past week, the American Bridge Co. is the low bidder and is expected to receive the contract. Plain material is stronger and now is at a minimum of 1.70c, Pittsburgh. The leading producer which has been naming 1.60c in some cases now is quoting uniformly on the higher basis.

Prices Are Firmer

Boston, July 3.—Structural steel prices are a shade firmer in this district. While some are asking 1.70c, Pittsburgh, one instance is heard of where a mill is holding out for 1.75c. While bids were opened June 26 for a 7-story building to be erected by the Clapp estate, in Portland, Me., involving some 500 tons, it is understood this has been held up temporarily. Work has begun on the new state pier in that city and proposals are expected shortly for the steel work on the upper portions, which will require between 700 and 800 tons.

Limited Tonnages Are Involved

Pittsburgh, July 3.—Structural shape tonnages contracted or negotiated for recently in this territory rarely exceed 500 tons. Smaller jobs are fairly numerous, mostly for state highway and railroad bridge work. However, the Ward Baking Co. now is taking bids on a new building requiring 500 or 600 tons of steel as well as a tonnage of concrete bars, and a similar tonnage of steel is involved in the candy factory on Thirteenth street, Pittsburgh, for Hardie Bros. Prices are getting stronger, some orders of limited size recently having been taken at the 1.80c, base Pittsburgh, level, but 1.60c to 1.80c still represents the quotable market. Specifications still are being filled on 1.60c contracts. Satisfactory deliveries from the mills still are hard to obtain even though high operating schedules are maintained.

Structural Demand Holds Up

Chicago, July 3.—With building operations continuing at a rapid pace, booking of structural steel continues with numerous moderate tonnages and an occasional large lot. The largest placed in the West recently involved 1774 tons for a plant for the Sullivan Machinery Co., at Michigan City, Ind. Mills are well filled with tonnages of plain material and the independent mill at Chicago has nothing further to offer for third quarter delivery. The market is strong at 1.75c to 1.85c, Chicago.

Over 2.00c Is Reported

Philadelphia, July 3.—The structural shape market reflects a firm tone. In some cases large consumers feel they still could do 1.60c, base Pittsburgh on large tonnages but there was no indication in the past week that anything was done under 1.70c. This price generally is the minimum. Most of the week's transactions were considerably higher, going over 2.00c Pittsburgh on prompt carloads. In some instances good sized tonnages were placed at 1.80c and this is the minimum of some makers.

CONTRACTS PLACED

Awards reported this week ..... 21,121 tons
Awards reported last week..... 17,494 tons
Awards reported two weeks ago.... 19,190 tons

250 tons, Freeport, Pa., bridge over Allegheny river, to Independent Bridge Co.

1774 tons for plant buildings for Sullivan Machinery Co. Michigan City, Ind., to Kenwood Bridge Co.

1400 tons, for locomotive repair shop for Missouri, Kansas & Texas railroad, Waco, Texas, to Mount Vernon Bridge Co.

501 tons for bridge over Kaw river, Kansas City, Mo., for Missouri Pacific railroad, to King Bridge Co.

169 tons for building for Federal Ice & Co'd Storage Co., St. Louis, to Mississippi Valley Structural Steel Co.

127 tons for two 35-foot and one 90-foot girder spans for bridge No. 113, for Missouri Pacific railroad, Joplin division, to American Bridge Co.

300 tons, Pentland hotel, Grand Rapids, Mich., to Lackawanna Bridge Works Corp.

600 tons Hayes office building, Erie, Pa., to Lackawanna Bridge Works Corp.

300 tons, Masonic temple, Binghamton, N. Y., to Lackawanna Bridge Works Corp.

3000 tons Willoughby exchange, Brooklyn, to an independent fabricator.

300 tons, Buick garage, eleventh avenue and Forty-sixth street, New York to Hedden Iron Construction Co.

500 tons, garage for Fifth Avenue Coach Co., New York, to Levering & Garrigues.

1000 tons, Seigal hotel, Columbus avenue and Eighty-first street, New York, to Hinkle Iron Works; previously reported awarded to Hinkle works, but structure was not identified.

400 ton, Manhatton college, New York, to Michaelman & Gordon Iron Works.

500 tons, Parochial school, New York, to George A. Just.

3500 tons, towers for the Ohio Public Service Co., Alliance, O., and vicinity to American Bridge Co.

100 tons, school at McKees Rocks, Pa. to Memphis Steel Construction Co.

125 tons, stand pipe for West Moreland Water Power Co., Jeanette, Pa. to Memphis Steel Construction Co.

800 tons, Heyman building, Sixteenth and Walnut streets, Philadelphia, to an independent fabricator.

450 tons, building for Crew-Levick Co., Pettys island, to an independent fabricator.

430 tons, garage for United Motors Service Corp., Philadelphia, to Belmont Iron Works.

325 tons, retort building for United Gas Improvement Co., Philadelphia, to Belmont Iron Works.

800 tons, for transmission towers, for Milliken Bros. Co., New York, to Belmont Iron Works.

1000 tons, for First National Bank, Ashland, Ky., reported to have gone to Fort Pitt Bridge Works.

700 tons, bridge for Delaware & Hudson railroad at Carbondale, Pa., to American Bridge Co.

900 tons, I-bars for Bartlett & Hayward, Inc., Baltimore, to American Bridge Co.

1000 tons, building for Lincoln Life Insurance Co., Fort Wayne, Ind., to Lackawanna Bridge Works Corp.

350 tons for Consolidated Gas Corp., New York, to McClintic-Marshall Co.

150 tons, apartment at Ninety-seventh street and Fifth avenue, New York, to Hedden Iron Construction Co.

400 tons, bridge, Gunpowder river, Baltimore, withdrawwn; general contractor installing steel span.

CONTRACTS PENDING

600 tons, building for Ward Baking Co., Pittsburgh, bids being taken until July 6.

600 tons, candy factory for Hardie Bros., Thirteenth street, Pittsburgh, bids being taken.

1900 tons, Spokane avenue bridge superstructure, Seattle bids open Aug. 4.

500 tons building for Clapp estate, Portland, Me., bids opened June 26 but understood to be held up temporarily.

700 to 800 tons, upper portions new state pier, Portland, Me., bids to be asked soon.

9000 tons, power plant for Brooklyn Edison Co., Brooklyn, bids to be closed in about 10 days.

300 tons, aggregate for three warehouses for National Biscuit Co., one each at Buffalo, Cincinnati and Philadelphia.

900 tons, bank at Fort Wayne, Ind., bids in.

1600 tons, Miramar apartment, Rocky River, Cleveland, bids in.

250 tons, Beaver county bridge, bids closed July 1.

300 tons, building for Westinghouse Electric & Mfg. Co., Thirtieth and Walnut streets, Philadelphia bids asked.

8000 to 10,000 tons, for Michigan Central railroad at Niagara Falls, American Bridge Co., low bidder and expected to receive contract.

400 tons, for bank, Ironton, O., bids being taken.

500 to 600 tons, for courthouse, Akron, O., bids being taken.

200 tons, extension to plant of Reeves Mfg. Co., Dover, O., bids being taken.

900 tons, shops for Erie railroad at Hornell, N. Y., Bates & Rogers, general contractors, bids asked.

400 tons, Masonic temple, Paterson, N. J., bids asked.

700 tons, hotel, Charlotte, N. C., bids asked.

400 tons, crane runway, Long Island railroad, bids asked.

500 tons, plant at Thirty-second street and Madison avenue, New York, for Edison interests, bids asked.

Coal Conference Recesses Still in Deadlock

Washington, July 3.—The bituminous coal conference in session here recessed today until Monday, July 10, with the miners and operators apparently as deadlocked as ever. Although Secretary Hoover says no government compromise proposal has been made, it is reported Secretary Davis has proposed arbitration. It is believed the strike situation is approach-

ing the point where the President warned strong steps would be necessary. On this point, the government has no power to operate the mines and the house has recessed until August 15. At the conference, the miners have stood adamant for a conference including the competitive fields while the operators are unyielding in their demand for district conferences.

In his address at the opening of the conferences last Saturday, President Harding, who called it, said:

"You are admonished to arrive at such understanding with measurable promptness, among yourselves. If the adjustment can not be reached by you alone, government aid will be available at your joint call. We wish you who best know the way to solution to reach it among yourselves, in a manner to command the sanction of American public opinion. Failing in that the servants of the American people will be called to the task in the name of American safety, and for the greatest good of all the people."

Wire Demand

Continues Active—Deliveries Retarded —Unable to Increase Output

WIRE PRICES, PAGE 4

Chicago, July 3.—With demand continuing on an active scale, although somewhat less than in April and May, wire mills find their greatest problem is in deliveries. Fuel and labor conditions prevent production being increased and with heavy order books deliveries are falling considerably behind. Prices are unchanged, the largest producer holding a schedule somewhat lower than independent manufacturers.

Committed for 60 Days

Pittsburgh, July 3.—Wire product plants are well committed for at least 60 days. They are operating at an average of about 80 per cent. Jobbers have placed fairly large orders and are maintaining well balanced stocks. Those producers disinclined to meet the American Steel & Wire Co.'s figure of 2.40c, base Pittsburgh, on nails are understood not to be selling many but, as previously reported, several have had to recognize that level and have been booking fairly numerous orders. A particularly well sustained demand for nails used in building construction has been noted, although demand for cement-coated nails is more or less indifferent. Often a carload order for nails will specify wire nails of various sizes, together with several kegs of the cement-coated kind. Other orders call for mixed carloads of nails, wire, wire fencing, etc. Wire is firm at 2.25c and all makers have shared in the widespread demand for it.

Current Needs Are Met

Cleveland, July 3.—Manufacturing consumers of wire, while they continue to press the mills for deliveries, apparently are receiving enough material to carry along their current operations. Small chance is being afforded, however, for them to accumulate any stock as the mills have all they can do with their present production to meet the immediate needs. A fair amount of new business is being placed. Usual fall terms for wire fence providing for inventories to be dated Nov. 1, now are in effect.

Take Over 100,000 Cars

Railroads End Six Months Purchases with 14,400 in June—4500 More Placed in Week—Army To Buy 7550 of European Type

RAILROAD TRACK MATERIAL PRICES, PAGE 4

New York, July 3.—With reported domestic freight car awards for June totaling 14,400 tons, the half year's equipment business reaches approximately 100,000 units. The actual total of the monthly awards to July 1 is 101,625. Besides these, 235 passenger cars were ordered in June for domestic railroads and 53 for export. In the month new freight car inquiries, part of which were placed, totaled 19,500; passenger, domestic 61 and export 20.

Locomotive awards were 56 domestic in June and 16 export. Inquiries for locomotives for the month were 66, all domestic.

Placing of approximately 1200 gondolas and hoppers by the New York Central is outstanding in the railroad equipment market for the week in the East. New inquiry at the same time is relatively light, although there are many thousand cars now being figured. Locomotive awards for the week include five for the Lehigh Valley, placed with the Baldwin Locomotive Works; 14 for the New York, Chicago & St. Louis, awarded to the Lima Locomotive Works; 10 for the Chicago & Eastern Illinois, and 15 for Southern railroads, awarded to the American Locomotive Co., and two for Mitsui & Co., for export, placed with the H. K. Porter Co. It is reported the Delaware, Lackawanna & Western will be in the market shortly for 30 locomotives.

Locomotives Are Placed

Cleveland, July 5.—An order for 14 locomotives have been placed by the Nickel Plate railway with the Lima Locomotive Works. The Community Traction Co. of Toledo has placed 500 tons of girder rails with the Lackawanna Steel Co.

Army to Buy Equipment

Washington, July 4.—Bids will be opened by the engineer corps of the war department on July 18 on 1200 tons of 80-pound steel rail and 491 tons of 67½-pound rail, equipped with angle bars and bolts. On the same day bids also will be opened by the war department on 10 tank cars, of 7020 gallons capacity each. On July 6 bids will be taken on 7554 European type railway freight cars, consisting of 5100 high side gondolas, 1550 low side gondolas, 529 flat cars, and 75 box cars.

Additional Light Sections Bought

Pittsburgh, July 3.—Additional orders for light rails, rarely involving more than a carload each, have been placed at from 1.60c to 1.75c, base Pittsburgh. Several of the larger producers are firm at the maximum while one or two independents still adhere to the 1.60c level. Rerollers are understood to be taking business at the equivalent of 1.55c, base Pittsburgh.

Only small orders for track accessories recently have been noted, most buyers continuing to fill their needs as they appear. Spike plants have a fair backlog but only a few inquiries involving tonnage have appeared from railroads. Standard spikes are quoted at 2.25c to 2.35c, base Pittsburgh. Small spike demand is weaker but the 2.50c price is considered firm. Tie plates are quoted at from $37.50 to $42.50 per ton or 1.87½c to 2.12½, base Pittsburgh. Orders noted recently involve 50,000 to 100,000 tie plates each. Track bolts are firmer at from 3.25c to 3.50c, base Pittsburgh, but occasionally the 3.00c price is heard.

Track Fastenings in Demand

Chicago, July 3.—Although track fastenings have been bought liberally for several weeks, demand appears to be continuing unabated and sales during the past week have been as large as at any time. Lots have ranged up to 16,000 kegs of spikes in a single order and 12,000 kegs of bolts in another order. Selling of these specialties at this time is the best it has been in a year. All railroads having contracts for standard steel rails with Chicago mills have released their tonnages and are seeking deliveries faster than mills can turn them out. Heavy specifications for steel for railroad cars are being filed against former orders and this has made specifications unusually heavy. Additional cars have been let and more repairs placed during the past week.

Light Rails in Small Demand

Philadelphia, July 3.—Several moderate lots of light rails have been placed in the past few days at 1.60c, base Pittsburgh which now appears to be the minimum figure. The demand for light rails continues small.

CAR ORDERS PLACED

Argentine state railway, 53 coaches, to Osgood Bradley Car. Co.

Northern Pacific, 1000 automobile 50-ton, 50-foot box cars and 250 steel underframe 40-ton stock cars to General American Car Co.

New York Central, 1106 hoppers to American Car & Foundry Co., 18 gondolas to Standard Steel Car Co. and 49 gondolas to Buffalo Steel Car. Co.

Chicago Great Western, repairs on 527 box cars, 154 to Sheffield Car & Mfg. Co., 200 to Pullman Co., 173 to Siems-Stembel Co., St. Paul, Minn.

Western Pacific, 2000 refrigerators to American Car & Foundry Co.

CAR ORDERS PENDING

Lehigh & New England, 50 composite gondolas.

Philadelphia & Reading, 100 refrigerator cars.

Delaware, Lackawanna & Western, 380 car bodies.

Pere Marquette, repairs to 1000 box, bids asked.

Chicago & Eastern Illinois, 15 baggage, bids asked.

Santa Fe, eight buffet, bids asked.

Philadelphia & Reading, 5 baggage, bids asked.

Engineers corps, war department, Washington, 7554 European-type freight cars as follows: 5100 high side gondolas, 1550 low side gondolas, 529 flat and 75 box; bids close July 6.

Boston Elevated, 40 tunnel cars, bids asked.

Metropolitan railway, Barcelona, Spain, 20 subway.

Reinforcing Bars Quieter

Less Activity Reported but Mills Are Booked Heavily—Only Attractive Tonnages Receiving Attention—Prices Hold Steady and Unchanged

REINFORCING BAR PRICES, PAGE 4

New York, July 3.—As far as known, 1.70c base Pittsburgh, now is the minimum on concrete bars. Large tonnages which might be expected to bring out the keenest competition, have been placed at 1.70c and some moderate sized lots have gone at 1.80c. Material premiums have been paid for spot shipment out of stock. The volume of business in this district during the past week has not been nearly as large as in recent weeks.

Active Market Is Noted

Pittsburgh, July 3.—An active market is noted in connection with concrete bars and one Youngstown, O. interest is working 24 hours daily on stock orders. Recent awards have involved tonnages up to 800 tons each. As the third quarter is entered, second quarter prices of 1.60c and under are disappearing. These levels fast are being supplanted by such quotations as 1.70c to 1.80c, base Pittsburgh.

Inactivity Is General

Cleveland, July 3.—New projects requiring concrete reinforcing bars have been slow in coming out this week and mills and fabricators report little activity. Rerolled bars have been advanced by one maker to 1.70c, mills, in carloads and 1.80c in less than carloads.

Turn Down Much Business

Chicago, July 3.—Sellers of reinforcing bars find more business offering than they are able to take, and as a result are figuring only attractive lots. Bar tonnage already sold is heavy and mill conditions are such that a sufficient supply to meet present demand is not certain. While prices are holding steadily for the most part, tonnage was taken recently by a steel warehouse at a price figuring back considerably under the general market. As has been the case through much of the year, the greater aggregate tonnage is made up of small lots under 100 tons, which are more attractive to sellers.

CONTRACTS PLACED

Awards reported this week	**3,000 tons**
Awards reported last week	**3,310 tons**
Awards reported two weeks ago	**6,685 tons**

700 tons, warehouse for Belknap Hardware Co., Louisville, Ky., to the Newport Rolling Mill Co., Newport, Ky.

500 tons, warehouse, garage, etc., for the Atlantic & Pacific Tea Co., Lang avenue, Pittsburgh, to Turner Construction Co.

500 tons for plant for Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., to Joseph T. Ryerson & Son.

400 tons, for warehouse for Acme Hardware & Supply Co., Akron, O. to Franklin Steel Works.

300 tons for hall of medicine, Yale University, to Bethlehem Steel Co.; general contractor, Thompson Starrett Co.

300 tons for Buick and Oakland service building, New York, to Concrete Steel Co.; general contractor, Thompson Starrett Co.

200 tons, for Ford body plant, Iron Mountain, Mich., to Worden-Allen Co.

100 tons, for highway work in Hardin county, Iowa, to Concrete Steel Co.

CONTRACTS PENDING

500 tons, building for Clarke estate, Kansas City, Mo., bids asked.

270 tons, county bridge West Seventy-third street, Cleveland, Great Lakes Engineering & Construction Co. low bidder.

225 tons, department store for J. B. Sperry, Port Huron, Mich., bids asked.

200 tons, building for the Ward Baking Co., Warren, O., bids being taken.

200 tons, buildings for Garrett Biblical institute, Evanston, Ill., bids asked.

200 tons, agricultural college building, University of Illinois, Urbana, bids open July 17.

125 tons, building for the Ward Baking Co., Pittsburgh, bids close July 6.

100 tons, warehouse for King Bros., Pittsburgh bids being taken.

100 tons, bridge at Ottawa, Ill., general contract to Koss Construction Co., Des Moines, Iowa.

100 tons, West Technical high school, Cleveland, bids closed July 3.

Cast Pipe Prices

Again Higher in the East—Jobber Demand for Steel Grades Big

PIPE PRICES, PAGE 4 AND 70

New York, June 3.—Prices on cast iron pipe have again advanced, the market now holding at $53.30, New York, on 6-inch and over and $58.30 on 4-inch, or an increase of about $3. With producers in this district booked up to Nov. 1 and demand generally strong, this action was not unexpected. An outstanding inquiry calls for 6100 tons of eight to 20-inch pipe for the water department, this city, bids to be closed July 8. East Orange, N. J., will open bids July 20 on a relatively small tonnage of 20-inch pipe, but reinforced concrete may be used. Reading, Pa., opens bids July 5, on 200 tons of miscellaneous sizes. Peru, N. Y., closed bids on 1000 tons 4 to 8-inch pipe June 29, but no award has been announced.

Demand from jobbers for butt welded pipe in merchant sizes is beyond the capacity of the mills. The stocks which always are carried by the mills in order to enable them to ship promptly, were wiped out sometime ago as the result of the heavy demand and the mills in most instances now are 60 to 90 days behind in their shipments. Demand shows no indications of letting up. Prices are firm but unchanged.

Small Parcels the Rule

Pittsburgh, July 3.—Small parcels, usually a single carload of various kinds of pipe, mainly small sizes of black and galvanized standard full-weight merchant pipe, continue to feature the tubular goods market. The jobber trade has been particularly active for some time past and promises to continue since no large stocks are being accumulated by them. Makers have enjoyed a good sized aggregate of business from their regular customers, their chief difficulty being to make satisfactory deliveries. These now are four weeks or more deferred. This has been and still is true of bessemer pipe due to the shortage of bessemer steel. A few gas and water lines are contemplated, taking tonnages up to several thousand tons. It is expected the buying of tubular goods of one kind or another will continue throughout the year.

Demand Continues Dull

Chicago, July 3.—Consumers of cast iron pipe are not active and comparatively little tonnage is now under consideration, a condition usual at midsummer. Most pipe shops are well booked, and the situation is satisfactory in all respects. Detroit is in the market for a small tonnage of 6-inch pipe, in addition to its former purchases.

Southern Market Strong

Birmingham, Ala., July 3.—Production and delivery are the problems in the cast iron pipe trade, both high pressure and soil pipe. Awards still are being booked for considerable tonnages. The movement through the port of Mobile for the West, seems unlimited. Shipments are being hurried now due to apprehension of interference by the railroad strike. Common labor is scarce in some of the foundries and efforts are being made to keep plants further supplied with help.

Ferro Demand Less

But Sales in Week Total 6000 Tons—All Alloys Generally Quieter

FERROALLOY PRICES, PAGE 4

New York, July 3.—The demand for ferromanganese has undergone some shrinkage. Sales, however, aggregated at least 6000 tons, most of which involved English metal. This business went at $67.50, tidewater, which continues to represent the market with the exception of some prompt carloads at $70. One importer of English metal is quoting $72.50 tidewater for August shipment and $70 on shipment from England in September and later. Some German ferromanganese has been sold for prompt shipment at $66 Baltimore. Figuring the reduced freight which became effective on Saturday, the market delivered at Pittsburgh now is $72.29 on English metal and $70.79 on German. Domestic metal is not a factor at this time as the makers are practically out of the market.

Sales of spiegeleisen during the past week aggregated about 400 tons which went at $35 to $36 furnace for 20 per cent metal.

Business in the special ferroalloys and alloy ores has been light, with prices firm. Carlots of 50 per cent ferrosilicon are selling at $55, delivered, with some producers asking $60, delivered. One company is asking $60, furnace. While a small quantity of ferrotungsten is available from New York warehouse at 40 cents a pound contained, domestic producers in some cases are asking up to 60 cents, preferring to wait for tariff action. Foreign ferrochrome is available from warehouse at 10 cents a pound contained for the high carbon grades and at 25 cents for low carbon grades. Most consumers are covered under their annual contracts and new business is scarce.

Sales of ferrovanadium have been in good volume, with prices firm at $3.50 to $3.75 a pound contained for high silicon grades, according to quantity, and at $3.75 to $4 for low silicon grades. The leading producer of ferromolybdenum reports steadily increasing

business, with prices maintained on sales to the steel makers at $2 to $2.50 a pound contained. Some sales of foreign or resale alloy have been made at $1.75 and $1.85.

Buying in Less Volume

Pittsburgh, July 3.—Ferromanganese buyers apparently have satisfied their requirements for some time to come. The majority have purchased English material. Several sellers report sales aggregating 5000 to 7000 tons each for delivery during July, August and September. Practically all of this material was sold at $67.50, Baltimore base, and while some importers are quoting $70 and $72.50, seaboard, the $67.50 price has not entirely disappeared. Domestic producers are sold up for a long time to come. Recent purchases involved up to 1000 tons each.

The spiegeleisen market is quiet, no new inquiries or sales being noted. The recently quoted prices of $35 and $36, f.o.b. furnace on 16 to 19, and 19 to 21 per cent material, respectively, are firm with the trend toward higher levels. Spiegeleisen at $50 already is talked of should ferromanganese reach $100 as suggested.

Other ferroalloy inquiries are scarce. In connection with ferrosilicon, the latest entrant here is the Edgewater Steel Co. for a single carload of 50 per cent. The recently attempted increase in price on this grade has failed and again $55, freight allowed, represents the minimum. On a small 5-ton lot recently closed, $60, freight allowed, was paid.

Is Active at Chicago

Chicago, July 3.—Ferromanganese is active at $75 seaboard, or $82.56, Chicago for prompt. Some offers for September delivery are made at $67.50 but most are at $70 seaboard, buyers assuming duty risk. Spiegeleisen is quiet. Ferrosilicon, 50 per cent, is offered at $55 for last half and $57 for prompt.

Fluorspar Prices Vary

Pittsburgh, July 3.—Spasmodic activity continues to be noted in the gravel fluorspar market. While some effort has been made to obtain higher prices up to $18 on the guaranteed 85 per cent calcium fluoride and 5 per cent silica material, $17.50 f. o. b. Kentucky and Illinois mines is fairly representative of the market on that grade. The Wheeling Steel Products Co. is in the market for 2000 tons, 1000 tons for Wheeling, W. Va., and a like amount for Portsmouth, O.

Makes Automobile Parts

The Taylor-Brown Co., Worcester, Mass., brass founder with offices at 35 Hermon street and foundry at 280 Grove street, now is engaged in production of automobile bushings and parts. The company recently took over the Eidder Co. and the Walter B. Taylor Brass Foundry, both of Worcester. The company produces castings aluminum, aluminum special, phosphor bronze, manganese bronze, gun metal, composition, brass, copper, zinc, lead, white metal, babitt metal and solder. W. H. Brown is president and W. B. Taylor treasurer.

The Nonferrous Metals

Prices Show Little Change as Buying Is Quiet but Volume of Consumption Remains Heavy in All Lines

	Copper, Electro delivered	Copper, Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	†Nickel spot
June 28.....	13.81¼	13.87½	30.87½	5.75	5.27½	18.00	5.00	34.00
June 29.....	13.81¼	13.87¼	30.75	5.75	5.27½	18.00	4.95	34.00
June 30.....	13.81¼	13.87¼	31.00	5.75	5.30	18.00	4.95	34.00
July 3.....	Holiday							
July 4.....	Holiday							

†Open market quotation.

NEW YORK, July 3.—The holidays and general uncertainty in business due to the coal and rail labor troubles, and the Europeans crises, have caused a slackening in new buying of metals and metal products the past week. Shipments on contracts have been going forward steadily and consumption is on an unabated scale in most lines. Shortage of labor is restricting both production and consumption of metals in various industries and districts. The large amount of business on books for June and July shipment has meant an absence of selling pressure and prices this week have shown an upward tendency for most of the important metals.

Electrolytic copper was obtainable during the week at 13.75c, delivered, for deliveries through September, but the principal selling agencies asked 13.87½c, delivered. The statistical position has been steadily gaining strength, as mine labor shortage has kept new supplies of copper smaller than had been expected. Stocks continue to decline. Both foreign and domestic demand was light this week. Casting copper was steady at 13.25c, refinery; lake at 13.87½c to 14c, delivered. The base price of seamless tubes was advanced ½c a pound.

Zinc prices recovered a little from the decline of the previous week. Large producers remained out of the market, the bulk of the business being done by dealers and small producers. Prime western zinc quotations advanced to 5.30c to 5.35c, St. Louis. Consumers were little interested, but the heavy May sales for June and July shipment have enabled producers to wait on the market. It is expected June shipments will exceed production by fully 8000 tons, causing a similar reduction in smelter stocks. High grade zinc prices held at 6.12½c to 6.25c, delivered.

Demand for pig lead was slow, but shipments were heavy. Some producers shipped twice as much lead in June as they produced, indicating a heavy draft on their stocks. The New York position was eased somewhat by sales of Mexican lead, duty paid, from the Perth Amboy smelter, but it was cheaper to send Mexican lead to Europe than to pay the duty and freight rates to consuming points outside New York. Quotations held at 5.50c to 5.55c, East St. Louis, 5.75c, New York, for prompt and July shipments.

Expectation of an increased visible supply as of June 30 and lack of new buying in the preholiday market, caused weakness in the tin market, both in London and New York; softness of sterling exchange rates on some days has been a factor. Straits tin prices declined from 31.25c on June 26 to 30.75c on June 29, recovering ¼c to 31c on June 30. The New York market was closed July 1 to 4, inclusive.

Antimony prices eased a little to 4.90c to 5.00c, duty paid, New York, for spot delivery, in an inactive market.

The aluminum market has been quiet with prices unchanged. Outside sellers continue to offer 98 to 99 per cent virgin ingot at 17.75c to 18.00c, duty paid, New York, while the larger importers are asking ½c and more above these levels.

Mill Products

(Base prices, f.o.b. mill)

SHEETS	
Copper, hot rolled 24 oz., min....	20.50
High brass	16.75
Zinc, ga. 9 to 18 (plates ½c less)	7.50
Lead, full sheets (cut ¼c more).	9.00
SEAMLESS TUBES	
High brass	20.50
Copper	23.25
RODS	
High brass, round, ¼ to 2½ inch	14.75
Naval brass rod.....	17.25
WIRE	
Copper	15.25 to 15.75
High brass	17.25

Old Metals

(Dealers' Buying Prices)

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	8.50
Chicago	8.50
HEAVY YELLOW BRASS	
New York	5.50
Chicago	6.50
Cleveland	5.50 to 6.00
ZINC	
New York	2.75
Cleveland	3.00
Chicago	2.75
HEAVY COPPER AND WIRE	
Cleveland	10.25 to 10.75
New York	10.75 to 11.00
RED BRASS TURNINGS	
New York	7.25
Cleveland	7.25 to 7.75
Chicago	7.75
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	5.50 to 6.00
New York	5.25 to 5.50
Chicago	6.00
ALUMINUM BORINGS	
Cleveland	6.50 to 7.00

Pig Iron Output Still Climbs

June Total of 2,356,418 Tons Marks Eleventh Consecutive Monthly Gain—Daily Average Rises from 74,495 Tons to 78,547 Tons—Active Furnaces Show Net Increase of 15—Only Two Stacks Blown Out

NOTWITHSTANDING adverse conditions in blast furnace operation and a one-day shorter month, coke and anthracite pig iron made in June showed almost a 50,000-ton gain, and carried on for the eleventh consecutive month an unbroken upward trend. During the month active stacks showed a net increase of 15, a slightly greater gain than that of May, when 14 were made active. The total pig iron produced in June aggregated 2,356,418 gross tons, as compared with 2,309,348 tons in May, the actual gain being 47,070 tons. This output stands as the highest since January, 1921, when 2,414,753 tons was made.

MONTHLY PRODUCTION

	1922	1921	1920
January	1,645,804	2,414,753	3,012,373
February	1,630,180	1,929,394	2,984,257
March	2,035,908	1,594,866	3,375,768
April	2,070,161	1,190,751	2,752,670
May	2,309,348	1,215,272	2,991,825
June	2,356,418	1,064,007	3,046,623
Total 1st half	12,047,819	9,409,043	18,163,516
July	.....	864,642	3,043,918
August	.....	954,901	3,145,536
September	.....	985,795	3,124,308
October	.....	1,234,450	3,288,341
November	.....	1,414,958	2,935,081
December	.....	1,642,775	2,700,268
Total 2nd half	.....	7,097,521	18,237,452
Grand total	12,047,819	16,506,564	36,400,968

Production of pig iron for the first half of 1922 totaled 12,047,819 gross tons. This was a gain of 2,638,776 tons over the 9,409,043 tons produced during the corresponding period of 1921.

Merchant pig iron produced in June totaled 414,361 tons and showed a gain of 3957 tons over the 410,404-ton output of the preceding month. On an average daily basis, this output represented 13,812 tons per day, and compared with the 13,239 tons in May was 573 tons better. Nonmerchant or steelworks furnaces, made 1,492,057 tons as against 1,898,944 tons in May, the increase being 43,113 tons. This was the best nonmerchant output since December, 1920. Reduced to an average daily basis, the June output represented 64,735 tons or 3479 tons better than the 61,256-ton output of the previous month.

AVERAGE DAILY PRODUCTION

	1922	1921	1920	1919	1918
Jan.	53,090	77,895	97,172	106,654	77,523
Feb.	58,220	68,906	102,904	105,270	82,794
Mar.	65,674	51,447	108,895	99,614	103,548
Apl.	69,005	39,691	91,754	82,479	109,112
May	74,495	39,202	96,510	67,991	111,351
June	78,547	35,466	101,533	70,467	110,538
July	.....	27,892	98,190	78,200	109,954
Aug.	.....	30,802	101,468	88,453	108,983
Sept.	.....	32,857	104,143	82,692	113,774
Oct.	.....	39,821	106,075	60,142	112,335
Nov.	.....	47,165	87,836	80,244	111,595
Dec.	.....	52,992	87,105	84,711	110,602
Ave.	66,562	45,223	99,456	83,910	105,290

The output of both merchant and nonmerchant iron in June was at the rate of 78,547 tons per day as contrasted with 74,495 tons in May, the increase being 4052 tons. The daily rate of production, therefore stands as the highest since December, 1920, and represents a gain of 182 per cent over the 27,892-ton low point of last July.

Blast furnaces active on June 30 totaled 190 as against 175 on May 31 and 161 on April 30. This number stands as the highest since December, 1920, when 202 were operating. The increase of 15 stacks over May compares with a gain of 14 during May and six during April. Seven merchant furnaces were blown in and one blown out, the net gain being six stacks. Of the nonmerchant class 10 were blown in and only one blown out or banked, the net gain being 9 stacks.

Of the total number of furnaces operating on June 30, 48 were merchant and 142 were nonmerchant. On the last day of the month the Steel corporation was operating 80 furnaces as compared with 74 on May 31 and 68 on April 30.

DIVISIONS OF PRODUCTION

1921	Merchant	Non merchant	Spiegel	Ferromanganese	Other ferro
Jan.	474,135	1,940,618	2,542	20,960	4,950
Feb.	338,383	1,591,011	11,566	17,447	4,067
Mar.	276,559	1,318,307	19,746	17,682	3,222
Apl.	238,539	952,212	14,744	13,266	3,163
May	215,703	999,569	2,379	6,853	4,553
June	178,854	885,153	....	4,536	6,090
July	141,326	723,316	4,015	1,509	3,178
Aug.	134,491	820,410	....	3,878	....
Sept.	157,728	828,067	....	3,289	35
Oct.	218,990	1,015,460	....	3,902	990
Nov.	304,535	1,110,423	....	3,525	1,065
Dec.	372,000	1,270,775	....	3,847	1,064
Tot'l 1921	3,051,243	13,455,321	55,042	100,694	32,377
Jan.	488,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
Mar.	390,643	1,645,265	2,095	11,604	1,102
Apl.	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	414,361	1,942,057	4,817	18,133	854

Ferromanganese production in June totaled 4817 tons and was a loss of 85 tons from the 4902 tons made in May. Spiegeleisen, however, with 18,133 tons in June showed an increase of 2701 tons over the 15,432 tons of the previous month.

Furnaces blown in during the month were: In Ohio Haselton No. 3, Republic Iron & Steel Co.; one Lorain, National Tube Co.; Mary, Sharon Steel Hoop Co.; Milton, Milton Iron Co.; Tod, Brier Hill Steel Co.; River No. 1, McKinney Steel Co. In Pennsylvania: Robesonia, Robesonia Iron Co., Ltd.; three furnaces Carnegie Steel Co. In New York: Buffalo "B," M. A. Hanna & Co.; Harriet "Y", Wickwire Spencer Steel Corp. In Tennessee: LaFollette No. 1, La-Follette Coal & Iron Co. In Alabama: Philadelphia, Sloss-Sheffield Steel & Iron Co. In Illinois: South Works Old No. 2, Illinois Steel Co. In Wisconsin: one Bay View, Illinois Steel Co. In Minnesota: Zenith, Zenith Furnace Co.

Stacks blown out in June were: In Pennsylvania: one Cambria, Midvale Steel & Ordnance Co.; Shenango No 3, Shenango Furnace Co.

JUNE PIG IRON

	No. of stacks	No. in blast last day of mo. June	May	Total tonnage made— Merchant	Nonmerchant	Totals— June	May
Pennsylvania	159	68	66	67,721	723,563	791,284	797,700
Ohio	80	41	35	74,677	480,384	555,061	512,700
Alabama	43	20	19	114,975	74,033	189,008	196,066
Virginia	19	..	..	.....	.....	.....	.....
New York	25	13	11	48,270	99,910	148,180	150,141
New Jersey	4	1	1	10,725	.....	10,725	5,636
Illinois	26	16	15	44,266	209,951	254,217	255,475
Colorado	5	3	3				
Indiana	16	12	12	16,485	271,212	287,697	291,106
Maryland	6	4	4				
Wisconsin	6	2	1				
Kentucky	7	2	2				
West Virginia	3	2	2	14,642	36,737	51,379	40,222
Tennessee	14	2	1				
Washington	1	..	..				
Georgia	2	..	..				
Texas	1	..	..				
Minnesota	3	2	1	14,869	30,194	45,063	39,563
Michigan	3	2	2				
Missouri	1	..	..				
Spiegel and ferro— all states	..	..	..	7,731	16,073	23,804	20,739
Totals	427	190	175	414,361	1,942,057	2,356,418	2,309,348

Scrap Activity Continues

(*Continued from Page* 10)

axles jumped to $20. Auto cast was quoted at $19 to $19.50, and machinery cast, $15.50 to $16.

Mark Down Buying Prices

Philadelphia, July 3.—Lower prices for the first time in many weeks are appearing in the scrap market. This is due largely to the fact that big buyers have put down their buying figures. The market tone is stronger, however, so that dealers regard the present easier tone as temporary. One large buyer reduced its buying price on blast furnace borings and turnings to $13 to $13.50 delivered and others have reduced similarly, so this level now represents the market. In the same way wrought pipe is without any apparent reason reduced to $13.50 to $14 delivered and No. 1 cupola cast, which from the pig iron market conditions might be expected to go up, has been reduced $1 and now is quoted $18 to $19 delivered. The exception is low phosphorus which is $1 higher and now is quoted at $19 to $21 delivered.

Labor Affects Buying

St. Louis, July 3.—The undertone of the scrap market is very strong, and but for labor troubles there is every reason to believe that business would develop in real volume. Consumers are in need of scrap but there is a general tendency to hesitate until something more definite is known relative to the labor situation. Mid-year inventory taking is given as another reason for the lull in purchasing. Yard stocks locally are much reduced. The Colorado Fuel & Iron Co. has purchased heavily at southern points, and absorbed a considerable portion of the tonnage which otherwise would have found its way to this district. Little country scrap is coming in. Demand for steel specialities, melting rails, cast scrap and foundry grades generally is good. Machine shop turnings were marked up in the week from $6 to $9. Railroad offerings the past several days included the Pennsylvania, southwestern region, 4500 tons; St. Louis Southwestern, 1500 tons; Missouri Kansas & Texas, 1200 tons; Big Four, blank list and Pullman Co. two cars.

Hopeful for Improvement

Birmingham, Ala., July 3.—The scrap market maintains hope of improvement in the near future. Demand for some grades is stronger and quotations generally are firmer. Reduction in freight rates has not yet extended the limits of shipments. Consumers in Chattanooga and Knoxville, in the future, however, may come in to the Birmingham market for a greater amount of scrap.

Plan Gary Housing Project

W. M. Hogg representing the National Tube Co. visited Gary, Ind., recently to make preliminary plans for the housing project for officials and employes of the company. The company plans to spend $2,000,000 during the next 12 months, according to Mr. Hogg. He was accompanied by several members of the national housing committee of the United States Steel Corp.

Rate Conference

Of Water Lines Interests Coast Trade —Buying Volume Increases

Seattle, June 30.—Stocking of some items of iron and steel, indications of changes in freight rates and a continued active domestic business marked conditions during the week. The export situation is not promising at present but sufficient inquiry has appeared to justify the hope that Japan and China will be buying factors during the latter part of the year. Building is active creating a demand for some classes of material. Representatives of some mills are not seeking outside business as they are unable to promise deliveries.

Deep interest is attached to the break in the intercoastal conference, the American-Hawaiian and Luckenbach lines having withdrawn. Whether the reason for breaking up the conference is to eliminate some of the weaker lines or to force higher rates when peace is again declared is an open question. With reduced railroad rates effective July 1 freights are likely to be paramount in importance for some time.

Pig Iron and Coke

Demand for pig iron is reported fair with prices firm. Coke supplies are nearly exhausted and the trade is awaiting the arrival of a shipment of English coke due next week. Pig iron is being ordered from southern furnaces and from European centers as orders warrant.

Bars, Plates and Shapes

Bars are showing a heavy turnover and all prices are firm. Shapes are selling well while the demand for light plates, especially 3/16 and ¼-inch, has recorded a noticeable increase within the last month. Heavy plates are only nominal. One exporting interest reports an inquiry from Japan for 400 tons of ship plates this week, the first of this kind of business indicated in many months.

Finished Material

Nearly all types of finished material are being sold in increasing volume, pipe and sheets showing the largest turnover. Jobbers state the demand for small galvanized pipe, ¾ to 1¼-inch has been phenomenal. Some stocks are entirely sold out and dealers are awaiting new supplies. The demand for larger sizes is improving. Steel pipe also is in demand with the smaller sizes running low. Sheets are moving well and some manufacturers are reserving their supplies for regular customers. Shingle bands and steel bars particularly are active.

Demand for logging and lumbering equipment of all grades is furnishing the trade a large portion of its business.

As the result of an auction of marine engines, it is announced that the shipping board has sold to the Williamette Iron & Steel Works, Portland, 30 marine engines from the Tacoma warehouse and 23 marine engines from the St. Johns warehouse to the Barde Industrial Corp.

Old Material

The demand for scrap is brisk with prices firm at around $10.50 and $11 for steel and $20 for No. 1 cast. Dealers are having difficulty in replenishing their stocks but with reduced freight rates it is expected that interior points will soon be shipping to the coast. Japan continues as a fairly active buyer of steel scrap.

Bids were opened this week for overhauling and remodeling the steel steamer DELLWOOD which has been turned over to the army for a cable repair ship. The lowest tender was submitted by Todd Dry Docks, Inc., $206,426.25. The Williamette Iron & Steel Works, Portland, was the next lowest $215,595. The Puget Sound navy yard entered an estimate bid of $398,660.

Bids for Seattle's Spokane avenue bridge, to cost $1,500,000, will be opened Aug. 4. The substructure contract was awarded earlier in the month for $264,497. The principal quantities involved in the construction of the superstructure include, 1900 tons of structural steel, 175 tons of machinery and 8570 yards of concrete.

Output of Beehive Coke Still Gains Slowly

Traffic congestion in operating non-union fields in the thirteenth week of the coal strike reduced the output from the previous week's total, according to estimates of the geological survey. There was no compensating increase in the fields affected by the strike the report states. The week's output is placed at less than 5,300,000 tons. For the twelfth week, coal production aggregated 5,361,000 tons, including 5337 tons of bituminous and 24,000 tons of anthracite. This compares with 9,550,000 tons in the corresponding week of last year.

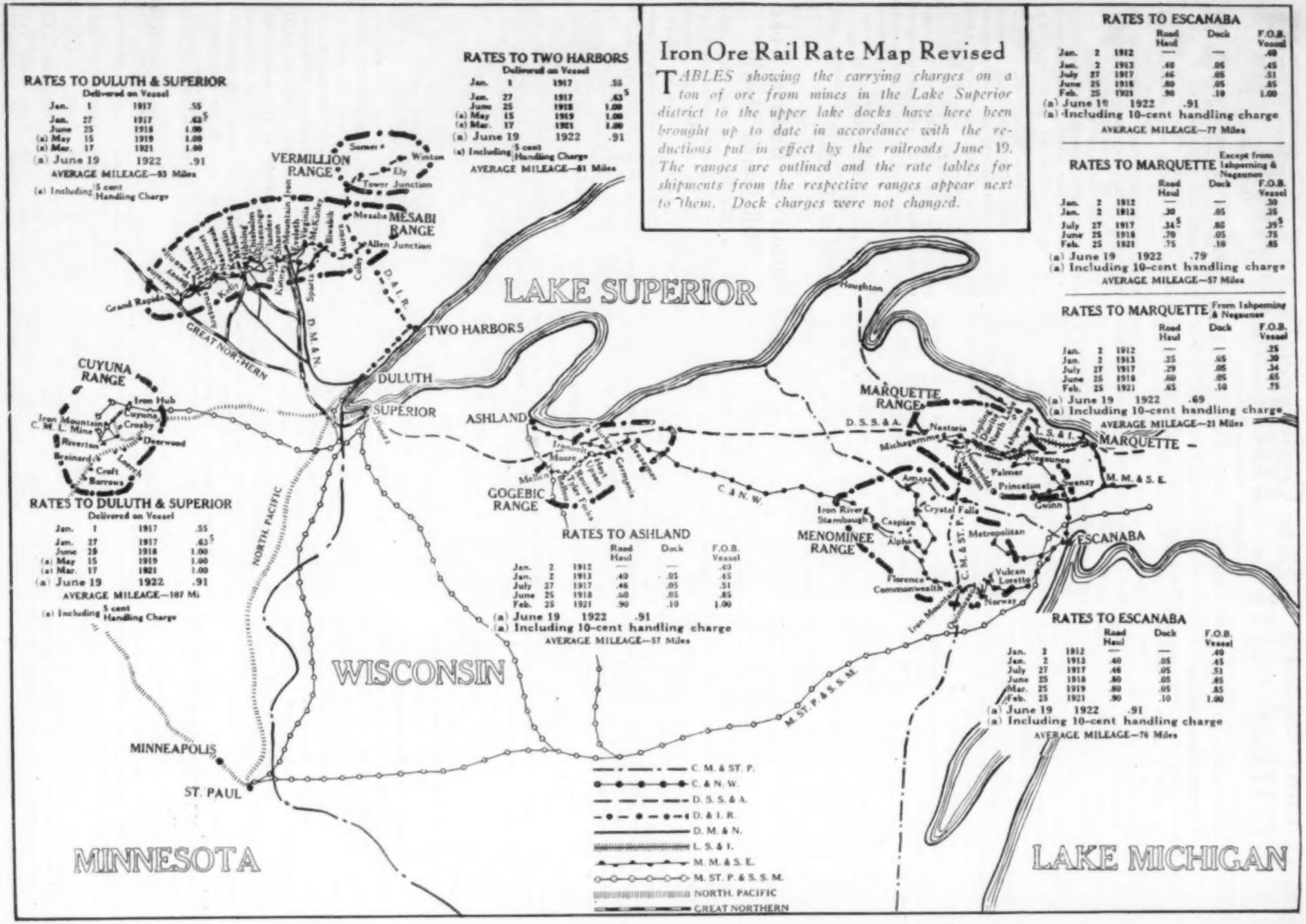
The estimated coke output of beehive ovens in the thirteenth week of the coal strike is 109,000 tons. This is an increase of 3000 tons over the revised production figures for the preceding week and is a gain of 20,000 tons over the fifth week, the most effective, of the strike. Compared with the last week preceding the strike, 109,000 tons represents a loss of 82,000.

Coke production in the weeks ending June 24 and June 17 as compared with the last two weeks preceding the strike may be seen in the following:

	Week ended—			
	June 24,	June 17,	Mar. 25,	Mar. 18,
Pennsylvania and Ohio	1922 77,000	1922 75,000	1922 134,000	1922 118,000
West Virginia	7,000	8,000	10,000	9,000
Alabama, Tenn., and Georgia	8,000	7,000	8,000	7,000
Virginia and Kentucky	9,000	8,000	9,000	8,000
Colorado and New Mexico	5,000	5,000	2,000	3,000
Washington and Utah	3,000	3,000	4,000	4,000
United States				
Daily average	18,000	18,000	28,000	25,000
total	109,000	106,000	167,000	149,000

Iron Ore Rail Rate Map Revised

TABLES showing the carrying charges on a ton of ore from mines in the Lake Superior district to the upper lake docks have here been brought up to date in accordance with the reductions put in effect by the railroads June 19. The ranges are outlined and the rate tables for shipments from the respective ranges appear next to them. Dock charges were not changed.



RATES TO DULUTH & SUPERIOR
Delivered on Vessel

Jan.	1	1917	.55
Jan.	27	1917	.63[5]
June	25	1918	1.00
(a) May	15	1919	1.00
(a) Mar.	17	1921	1.00
(a) June	19	1922	.91

AVERAGE MILEAGE—93 Miles

(a) Including 5 cent Handling Charge

RATES TO TWO HARBORS
Delivered on Vessel

Jan.	1	1917	.55
Jan.	27	1917	.63[5]
June	25	1918	1.00
(a) May	15	1919	1.00
(a) Mar.	17	1921	1.00
(a) June	19	1922	.91

(a) Including 5 cent Handling Charge

AVERAGE MILEAGE—81 Miles

RATES TO DULUTH & SUPERIOR
Delivered on Vessel

Jan.	1	1917	.55
Jan.	27	1917	.63[5]
June	25	1918	1.00
(a) May	15	1919	1.00
(a) Mar.	17	1921	1.00
(a) June	19	1922	.91

AVERAGE MILEAGE—107 Mi

(a) Including 5 cent Handling Charge

RATES TO ASHLAND

		Road Haul	Dock	F.O.B. Vessel
Jan. 2	1912	—	—	.40
Jan. 2	1913	.40	.05	.45
July 27	1917	.46	.05	.51
June 25	1918	.60	.05	.65
Feb. 25	1921	.90	.10	1.00
(a) June 19	1922	.91		

(a) Including 10-cent handling charge

AVERAGE MILEAGE—87 Miles

RATES TO ESCANABA

		Road Haul	Dock	F.O.B. Vessel
Jan. 2	1912	—	—	.40
Jan. 2	1913	.40	.05	.45
July 27	1917	.46	.05	.51
June 25	1918	.60	.05	.65
Feb. 25	1921	.90	.10	1.00
(a) June 19	1922	.91		

(a) Including 10-cent handling charge

AVERAGE MILEAGE—77 Miles

RATES TO MARQUETTE
Except from Ishpeming & Negaunee

		Road Haul	Dock	F.O.B. Vessel
Jan. 2	1912	—	—	.30
Jan. 2	1913	.30	.05	.35
July 27	1917	.34[5]	.05	.39[5]
June 25	1918	.70	.05	.75
Feb. 25	1921	.75	.10	.85
(a) June 19	1922	.79		

(a) Including 10-cent handling charge

AVERAGE MILEAGE—57 Miles

RATES TO MARQUETTE
From Ishpeming & Negaunee

		Road Haul	Dock	F.O.B. Vessel
Jan. 2	1912	—	—	.25
Jan. 2	1913	.25	.05	.30
July 27	1917	.29	.05	.34
June 25	1918	.60	.05	.65
Feb. 25	1921	.65	.10	.75
(a) June 19	1922	.69		

(a) Including 10-cent handling charge

AVERAGE MILEAGE—21 Miles

RATES TO ESCANABA

		Road Haul	Dock	F.O.B. Vessel
Jan. 2	1912	—	—	.40
Jan. 2	1913	.40	.05	.45
July 27	1917	.46	.05	.51
June 25	1918	.80	.05	.85
Mar. 25	1919	.80	.05	.85
Feb. 25	1921	.90	.10	1.00
(a) June 19	1922	.91		

(a) Including 10-cent handling charge

AVERAGE MILEAGE—76 Miles

Mills Quote on New York Central's Inquiry

Prices quoted the New York Central railroad on finished materials on which bids were opened June 29 reflected the generally advancing tendency in the steel market. The road, among other items, took bids on 4000 tons of bars, plates and shapes. The opening was notable for the number of mills represented by the bids. The Lukens Steel Co. quoted 2.09c, base, West Newberry Junction on plates both under and over ¼-inch; the Illinois Steel Co. 1.75c, base, Chicago, on the four items; the Donner Steel Co., 1.80c, base, Buffalo, on bars; the Lackawanna Steel Co., 1.86c, base West Seneca, N. Y., on all four items; the Bourne-Fuller Co., 2.00c, base Cleveland on bars; the Inland Steel Co., 2.00c, base Indiana Harbor on both classes of plates; the Bethlehem Steel Co., 2.02c, base, West Newberry Junction on shapes and both classes of plates; the Alan Wood Iron & Steel Co., 1.99c base, West Newberry Junction on plates ¼-inch and over and the Carnegie Steel Co., 1.70½c, base Youngstown on all four items.

On 400 tons of billets, the Wheeling Steel Corp. quoted $39 base per gross ton, Portsmouth, O.; the Alan Wood Iron & Steel Co., $45.79 base, West Newberry Junction; the Cambria Steel Co., $40 base Pittsburgh, and the Donner Steel Co., $41 base Buffalo.

On 500 tons of sheets, the Bethlehem Steel Co. named 3.47c, base, West Newberry Junction, on black, 4.47c on galvanized, and 2.72c on blue annealed; the Falcon Sheet Steel Co. quoted respectively, 3.20½c, 4.20½c and 2.45½c, base Youngstown; the Bourne-Fuller, 3.40½c, base Cleveland, on the black, and 4.40½c on galvanized; the Berger Mfg. Co. 3.30c, 4.30c and 2.65c base Pittsburgh; the Reeves Mfg. Co. 3.55c base Alliance, on black and 4.55c on galvanized; the Mansfield Sheet & Tin Plate Co. 3.20c, base Pittsburgh on black; the Sharon Steel Hoop Co. 3.25c, base Youngstown on black and 2.40c, base on blue annealed; the Newport Rolling Mills Co. 3.59½c, 4.59½c and 2.89½c base Buffalo; the Seneca Iron & Steel Co., 3.50½c base Buffalo on black; and the Republic Iron & Steel Co. 3.25½c base Youngstown, on black and 4.25½c on galvanized.

Completes Steel Foundry

The Lorain Steel Co., Johnstown, Pa., recently completed the construction of a new addition to its open-hearth plant. The extension will have a 6-ton and a 3-ton electric furnace, both of the Heroult type. The new foundry, which covers 160 x 320 feet, is equipped with two 15 and one 10-ton traveling cranes, complete molding machine, core room and cleaning facilities to handle street car track work, mill, mine car and railway steel castings. G. W. Merrefield is superintendent and J. J. Walsch and W. J. Watkins are assistants.

File More Complaints on Pittsburgh-Plus

Chattanooga, Tenn., July 3.—Considerable testimony against the steel industry's practice of selling steel based on Pittsburgh has been taken by J. W. Bennett, examiner for the federal trade commission, in the hearings which have been held by him in the past week. The testimony is similar to that taken at Milwaukee, Minneapolis, Duluth and Chicago in the series of hearings the commission has been conducting to get data from manufacturers complaining of the price practice.

Among the witnesses appearing here have been F. S. Mohns, general manager of the American Bolt Co., Birmingham; Sam C. House, president of the House Hasson Hardware Co., Knoxville; Robert Ingalls, president of the Ingalls Iron Co., Birmingham; and Bruce Keener, president of the C. M. McClung & Co., Knoxville, steel jobbers.

Say Steelmakers Submit Questionnaire Data

Washington, July 3.—Economic experts and attorneys for the federal trade commission continue to analyze the data submitted by the Bethlehem-Lackawanna and the Midvale-Republic-Inland interests in response to the commission's questionnaire, but the commission has not yet taken a definite stand on the 3-company merger or made any move to speed the hearing on the Bethlehem-Lackawanna complaint, which is now scheduled for July 24.

Independent steel producers to which the questionnaire has been sent have begun to respond, members of the commission say. These questionnaires seek the definite tonnages of various steel products shipped by each producer to each state, Alaska, the District of Columbia and to foreign countries in 1919, 1920 and 1921. The commissioners say the data are sought only as evidence in the merger hearings and not as the groundwork for a general attack upon the steel industry.

Some Valley Sheet Mills Closed for Week

Youngstown, O., July 3.—Following the custom of former years all sheet mills in this district will be idle over July 4. Plants were closed last Saturday and only 56 per cent of mill capacity will resume Tuesday night. This week's schedule calls for operating 28 mills at the Brier Hill Steel Co., 15 at the Youngstown Sheet & Tube Co., 10 at the Newton Steel Co. and 9 at the Sharon Steel Hoop Co.; a total of 62. Other makers will wait until next monday to get their plants underway again. All finishing departments throughout the valley, will be in operation this week.

Independent open-hearth activity remains at 88 per cent of capacity, the same as the last eight weeks and represents 11 furnaces each at the Republic Iron & Steel Co., the Brier Hill Steel Co. and the Youngstown Sheet & Tube Co., seven at the Trumbull Steel Co. and five at the Sharon Steel Hoop Co.

With the lighting of the Mary stack of the Sharon Steel Hoop Co. at Lowellville, O. and one stack of the Haselton group of the Republic company last week, blast furnace operation was increased to 64 per cent. Active blast furnaces are distributed five at the Carnegie Steel Co.; four at the Youngstown Sheet & Tube Co. and the Brier Hill Steel Co., and one each at the United Iron & Steel Co., the Trumbull Steel Co. and the Sharon Steel Hoop Co., making a total of 18 active smelters.

The bessemer converters of the Republic company will begin blowing Wednesday to supply steel for the company's pipe mills. In addition the Republic will operate three finishing, both blooming, one plate and five pipe mills. Miscellaneous schedules embrace one of the Brier Hill Co.'s plate mills; the bessemer converters, one bar and 10 pipe mills and the rod and wire departments at the Youngstown Sheet & Tube Co.

Shipping Manganese Ore

Washington, July 3.—Sixty carloads of manganese ore are being shipped daily from Tchiatouri, Georgia, but owing to the necessity for transshipment and a shortage of freight cars the mines in Transcaucasia are not operating at anywhere near capacity. Trade Commissioner Barton at Tiflis has informed the department of commerce. The famine has done much to retard mine development work, although more progress along this line now is being made.

Engineering Trades Are Reviving

British Works Take Orders for Locomotives and Oil Tanks—Continental Makers Continue To Compete Aggressively in Pig Iron and Semifinished Material—Heavy Sheets Reduced by Scotch Mills

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$4.43

LONDON, July 3.—Increasing orders for locomotives reflect the slowly improving situation in the engineering trades, following the recent lockouts. The English Electric Co. has taken 36 main line locomotives for the electrified sections of the Japanese Imperial railways. The North British Locomotive Co. has received 10 locomotives for West Africa. The Teeside Bridge & Engineering Works have closed for 15 large oil tanks for Singapore.

Firmness in pig iron has been supported by a strong coke market. On a recent dip, East Coast hematite has sold at £4 12s ($19.25), French and Luxemburg pig iron producers continue to offer strong competition to Scotch makers. Continental mills also are worrying Welsh makers of semifinished material with quotations on billets of around £6 18s ($30.55) c.i.f.

Japan has been buying sheets in the British market. Scotch makers have reduced heavy gages of sheets 10 shillings ($2.22) to £15 12d 6s ($69.15). The tin plate market is inactive.

Germany now is buying a less tonnage of French steel. The Cockerill works in Belgium has taken 5000 tons of rails for the Soracabana railroad.

More Furnaces Being Lighted in Great Britain

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.42

BIRMINGHAM, Eng., June 22.—The beneficial effect of the settlement of the lockout in the engineering trades is making itself felt very slowly in the iron and steel trade. In the northeastern district one furnace has been started by Messrs. Cochrane at Ormesby. A second furnace is to be started soon at Redcar, on the banks of the Tees, by Dorman & Long Ltd., and within a fortnight a second furnace is to be relighted. In the Scotch district the demand has improved with the result that two more furnaces are expected to be in operation shortly.

The export trade at Middlesbough keeps up fairly well. Belgian and Luxemburg iron is being offered at Grangemouth, Scotland, at figures with which Cleveland cannot compete. This tends to produce a spirit of caution in regard to prices and no advance is likely. On the other hand, prices show greater firmness for foundry material. The case is different with hematite in which the poor demand from the mills fails to absorb the output from the furnaces. There is some cutting of prices enabling this class of pig iron to be bought at £4 12s 6d ($20.44) for mixed numbers.

Foundrymen expect to benefit from a substantial order for 20,000 tons of cast iron segments recently placed to meet the requirements of constructional work on the London electric railways.

The West Coast should benefit from the re-starting of a number of the Sheffield steelworks which have been idle for three months at least. The West Coast furnaces have been putting iron into stock rather heavily lately. The amount is estimated to be at least 60,000 tons. Until this iron is sold it is not likely that more furnaces will be re-started. Eleven furnaces are operating in that district, some of which are making ferromanganese for which there is still a good export inquiry, especially from America.

The blast furnaceman is getting a little relief in his fuel costs, being able to obtain Durham blast furnace coke at £1 6s 6d per ton, delivered at the works. More iron is being bought, most of which is delivered on Teeside.

Further details are now available with regard to the price agreement recently arrived at by the steel makers of England and Scotland. For sometime the market has been thrown open to inter-district competition, with the result that Scotch steel has found it way as far distant as Birmingham. The manufacturers have now resumed their arrangements as to territorial limits, each district having its sale area allotted. The practical effect of this has already been experienced by constructional engineers in Birmingham who have failed to obtain quotations from English districts like Middlesbrough or from Lanarkshire in Scotland.

A matter of more interest and to some extent compensating the consumer for this loss of free competition is the new arrangement under which the steelmaker will supply steel at export prices on receipt of a guarantee that the material is to be used on construction for export. The British engineer has considered it a hardship for him that the foreign buyer should get his steel as much as £1 cheaper than the home customer. In spite of the safeguards, there is no great confidence that the agreements will be carried out.

There are signs of re-opening business in the finished steel trade. The big order for cast iron segments already referred to, representing a value of £250,000, divided between four firms will carry with it requirements for a great deal of constructional steel. After a long delay it appears that the railways are now coming in the market, the Caledonian railway having ordered 20 locomotives and 500 mineral wagons. The Sheffield firms expect to get orders for the necessary steel tires for these vehicles. The Barrow works are continually getting new business in rails and have a month's work on hand.

Messrs. Cammell, Laird of Sheffield have booked an order for 400 railway wagons for India, which are to be built wholly of steel. The axles and tires are to be made at the Penistone works of the company.

A little improvement is apparent in the Staffordshire iron trade, though it is almost entirely restricted to the works making best iron. They have been encouraged by the receipt of orders from Canada, India and Australia. For some time past ordinary bars have been obtainable at £2 10s ($11.65) at works, but it appears this price has been cut. Business is so slow a number of leading works are wholly idle.

There is a fair sale for nut and bolt iron for which for a long time Belgium was the chief source of supply. The No. 3 brand no longer attracts, having been

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace or F.o.b.

Corrected to Date by Cable

SEMIFINISHED STEEL

	$	£ s d
Billets, soft steel	30.98	7 0 0
Sheet bars	30.98	7 0 0
Wire rods	42.05	9 10 0
FINISHED STEEL		
Steel bars, England, ⅜ to 3-inch	39.83	9 0 0
Steel bars, England, ⅜ to 3-inch, for export	37.62	8 10 0
Plates, ship, bridge and tank, Scotland	39.83	9 0 0
Plates, ship, bridge and tank, England, for export	37.62	8 10 0
Plates, ship, bridge and tank, Scotland	39.83	9 0 0
Plates, ship, bridge and tank, Scotland, for export	37.62	8 10 0
Beams, England	39.83	9 0 0
Beams, England, for export	36.51	8 5 0
Beams, Scotland	39.83	9 0 0
Beams, Scotland, for export	37.62	8 10 0
Sheets, black, 24 gage	47.03	10 12 6
Sheets, galvanized, 24 gage	69.15	15 12 6
Rails, 60 lbs. and over	35.40	8 0 0
Rails, 60 lbs. and over, for export	33.20	7 10 0
Tin plate, base box, 108 lbs.	4.33	0 19 6
Steel hoops	46.47	10 10 0
Steel hoops, for export	44.25	10 0 0
PIG IRON		
Hematite, East Coast, mixed numbers	20.48	4 12 6
Hematite, West Coast, mixed numbers	21.81	4 18 6
Basic, Middlesbrough	17.70	4 0 0
No. 3 foundry, Middlesbrough	19.92	4 10 0
No. 3 foundry, Derby, Leicester, Nottingham	18.26	4 2 6
No. 3 foundry, Northamptonshire	17.16	3 17 6
No. 3 foundry, Staffordshire	18.26	4 2 6
No. 3 foundry, Scotch	20.48	4 12 6
Ferromanganese, 76 to 80 per cent	66.38	15 0 0
Ferromanganese, 76 to 80 per cent, for export	63.06	14 5 0
COKE		
Yorkshire furnace	4.22	0 19 0
Yorkshire foundry	6.09	1 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

PIG IRON

	$	Marks per metric ton
Hematite, Oberhausen	17.48	6724
Foundry, No. 3, Oberhausen	15.95	6136
Bessemer Stahleisen, Siegen	16.38	6300
COKE		
Ruhr furnace	3.40	1308
Ruhr foundry	3.52	1355
SEMIFINISHED STEEL		
Billets	24.48	9415
Sheet bars	23.32	8970
Wire rods	22.80	8770
FINISHED STEEL		
Standard rails	30.16	11,600
Merchant bars	27.07	10,410
Structural shapes	26.35	10,135
Ship plates	30.16	11,600
Medium plates, 3 to 5 millimeters	34.13	13,125
Sheets, below 3 millimeters	35.98	13,840
Tin plate	75.40	29,000
Plain wire	27.56	10,600
Bands and strips	30.08	11,570

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	26.46	315
Basic Bessemer, Lorraine	18.48	220
Foundry, Longwy, No. 3, sand-cast	17.64	210
Foundryy, Longwy, No. 3, chill-cast	18.48	220
Ferromanganese, 76 to 80 per cent	78.12	930
COKE		
French furnace	8.57	102
German furnace, f.o.b. frontier	7.81	93
French foundry	10.50	125
SEMIFINISHED STEEL		
Blooms	26.46	315
Billets	28.14	335
Sheet bars	28.14	355
FINISHED STEEL		
Standard rails	46.20	550
Merchant bars	36.54	435
Angles	39.90	475
Normal beams and profiles	39.90	475
Plates, ship and tank, 10 millimeters and thicker	49.56	590
Plates, bridge and tank, 5 to 10 millimeters	53.76	640
Sheets, black, 3 millimeters	60.48	720
Sheets, blue annealed, 2 millimeters	75.60	900
Shafting, cold-drawn, 40 to 60 millimeters	71.40	850
Bars, 2 per cent nickel steel	92.40	1100

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	16.36	205
Basic open-hearth, Belgian	17.96	225
Gray forge, Belgian	17.16	215
Foundry, No. 3, Belgian	18.35	230
Foundry, No. 3, Luxemburg	18.35	230
Foundry, No. 3, Lorraine	18.35	230
SEMIFINISHED STEEL		
Blooms	24.74	310
Billets	25.54	320
Sheet bars	27.13	340
Wire rods	38.30	480
FINISHED MATERIAL		
Standard rails	31.92	400
Merchant bars	33.12	415
Normal beams and profiles	30.72	385
Plates, 5 millimeters and thicker	37.91	475
Sheets, black, 3 millimeters	40.70	510
Sheets, galvanized, 1 millimeter	97.76	1225
Plain wire	47.88	600
Galvanized wire	61.85	775
Wire nails	35.51	445

All prices are f.o.b. furnace or works.

beaten in competition by Staffordshire's second quality material selling at £10 ($44.23). It now appears that this price has been cut by Lancashire, which is delivering iron into the Black Country at £9 12s 6d ($42.54).

A little improvement is noted in the galvanized sheet trade, encouraging business being done with India and the colonies, enabling the mills to work somewhat more regularly. The tin plate trade is showing a decided revival with orders coming forward from the continent and South America. Germany is a good buyer. The makers are able to maintain tolerable firmness of prices at 19 shilling 6 pence ($4.31) to 19 shilling 9 pence ($4.35). The prices of tin and cheap bars continue at £7 7s 6d ($32.59). For better class billets at £7 15s ($34.25) a certain amount of competition has developed and makers are not confident they can maintain this figure.

Volume of Business in France Growing

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
224 Rue de Rivoli.

PARIS, June 22.—Four additional blast furnaces were lighted and a number of steel mills restarted during April in France—indicating the improvement that is taking place. Although the volume of business is increasing prices allow only a small margin of profit owing to high cost of production. The last item is influenced by high wages which cannot be reduced until living costs have been brought down.

Franc—$0.09

The price of reparations coke has again been fixed at 90 francs ($8.10) per metric ton for June. A number

of coke producers in the northern region of France are planning to light their ovens. An effort will be made to bring down the price of French furnace coke to the level of German coke now being delivered to France. Coke produced in northern France is considered of better quality than the Ruhr coke.

Pig iron production is increasing. The price of 225 francs ($20.25) per metric ton for No. 3 Longwy chill-cast is being firmly maintained. The question of the reconstitution of the Comptoir des Fontes, pig iron selling syndicate, is again being considered. English competition on hematite is very keen. The Comptoir des Hematites maintains its official price of 360 francs ($32.40) although sales are being negotiated at 300 francs ($27) to 330 francs ($29.70), according to destination.

The semifinished steel market continues active although exports to Germany have fallen off. Basic bessemer ingots are offered at 280 francs ($25.20) to 295 francs ($26.25) per metric ton. The Acieries de Micheville reopened on May 27. Their production of rolled steel is limited for the present to blooms and billets, larger than 90 millimeters. The American mills which this company is installing will be ready within the next few months, when the production of rails, beams and shapes will be resumed.

The demand for beams and other heavy shapes is steadily increasing and prices remain firm. Merchant bars are quoted around 430 francs ($38.70) per metric ton. The plate and sheet department is slowly improving although English and Belgian competition continues to be very active. Belgian mills are offering basic bessemer plates, 5 millimeters and heavier, at 535 French francs ($48.15) delivered to frontier station, duty paid. English prices are equivalent. One concern in the eastern region is said to have booked an order for 2500 tons of various gages at an average price of 480 francs ($43.20) per metric ton.

Belgian Orders Increasing in Size

European Staff Correspondence

PARIS, June 22.—The iron and steel market of Belgium is showing signs of improvement. Orders are increasing in number and importance. Prices are being maintained. Most producers have well filled order books and deliveries are becoming more and more extended. Buyers seem inclined to cover their requirements as far ahead as August. It is not probable, however, that this will result in a readjustment upward of prices, owing to English and Luxemburg competition. A number of concerns are planning to blow in additional furnaces. The Usines Metallurgiques du Hainaut at Couillet expect to blow in two stacks soon.

Numerous orders for beams, shapes and sheets have been booked recently, but at prices which leave a very small margin of profit if any. Among other large producers, Providence, Ougree Marihaye, Monceau Saint-Fiacre and Sambre & Moselle are reported to have booked sufficient tonnage for continuous operations for the next two months. Buyers continue to send out inquiries.

Franc—$0.085

In the export trade competition is very keen, and even Italy which before the war was a buying country is now looking for an outlet for her products in foreign markets. Belgian firms are preparing bids on ten locomotives and tenders for Siam. They also intend to submit quotations on a large rail inquiry from the same country. Two plants in the Hainaut district are now working on an order for 500 cars recently received from Brazil. The Societe Belge pour l'exportation industrielle has been awarded an order for three locomotives for Brazil which will be executed at the Haine-Saint-Pierre shops. India, China, Japan, New Zealand and Tasmania are closed to Belgian products.

The demand for merchant bars is light. Quotations of 405 francs ($35.40) are current for the domestic market. This price is shaded 10 francs ($0.85) on export business. Plates and light gage sheets are also moving slowly and prices on these commodities are constantly changing. English offers are even more attractive than domestic quotations. In the foundry department there are many inquiries but very few result in orders.

As to prices in general, the following indicate the market: No. 3 foundry, 230 francs ($19.55) to 235 francs ($20) per metric ton; basic bessemer ingots, 300 francs ($25.50) to 305 francs ($25.90); rails, 390 francs ($33.15) to 400 francs ($34) as compared to 365 francs ($31) to 375 francs ($31.90) for export; 5-millimeter plates, 475 francs ($40.35) to 485 francs ($41.20); black wire, 600 francs ($51) to 625 francs ($53.10).

Quotations on Welsh Tin Plate Falling

European Special Correspondence

CARDIFF, South Wales, June 22.—Prices of Welsh tin plate are decreasing, and makers declare that if quotations continue to fall some of the works will have to close. However, there is a certain indication in the market that stocks are running short. Although consumers hope to obtain still lower prices, good inquiries continue to be received. Orders have been booked for June delivery at 19s 1½d ($4.24) basis IC f.o.b., but sellers are holding out for better terms. Germany has purchased IC's and lights, and the Far East and Argentina have bought fair quantities, while Portugal continues to buy F. C. B. Y's at £ 1 17s ($8.22), iron hooped f.o.b.

Odd sizes and wasters have been done for the home trade, the former at 19s 1½d ($4.24) f.o.t., and wasters at 17 shillings ($3.77) basis f.o.t. Ternes are quiet.

The reduction in railway rates does not mean much for the Welsh tin plate trade, as it represents only ½ to 1 pence per box on shipments from works to the docks.

Sterling—$4.45

Current prices are: Cokes, 14 x 20 inches, 19 shillings to 19s 6d ($4.22 to $4.33); cokes, quarters, 19s 3d to 19s 6d ($4.27 to $4.33); cokes 10 x 20 inches £1 6s 6d to £1 7s 6d ($5.89 to $6.11); cokes, 20 x 28, £1 18s to £1 19s ($8.45 to $8.67); ternes, 20 x 28 inches, £1 13s 6d to £1 14s 6d ($7.44 to $7.67).

The galvanized sheet trade continues depressed, but prices are unchanged at £ 15 15s to £16 ($70.08 to $71.20) for 24 gage corrugated in bundles. There is practically no activity in thin gages. Sheet and tin bars are unchanged at £7 7s 6d ($32.81). Nickel is weak at £162 10s ($723.12) for home and export.

The scrap market has become dull and supplies of good material are plentiful. Prices are as follows: Heavy steel scrap, £3 6s to £3 12s 6d ($13.46 to $16.12); bundled steel scrap and shearings, £2 17s 6d to £3 7s 6d ($12.78 to $13.79); steel turnings, £2 15s to £3 ($12.23 to $13.35); mixed wrought iron and steel scrap, £1 15s to £3 7s 6d ($7.78 to $15.01) according to weight; heavy cast iron scrap £3 10s to £4 ($15.57 to $17.80); and good machinery scrap for foundry use, £4 to £4 5s ($17.80 to $18.91).

Krupps Negotiating for Russian Sand

London, June 22.—The fact that Friedl Krupp, A. G., is negotiating for the lease of 135,000 acres of agricultural land in the Salsk, Cossak region in Russia, has been confirmed officially from Essen. The purpose of this transaction is to assist in the agricultural rehabilitation of Russia and

to develop an outlet for the agricultural machinery and equipment which the Krupp company is making. Immediately after the war Krupps began work on changing over one of their large munition factories to the manufacture of mowing machines, binders, disc harrows and other agricultural implements. In this connection a malleable casting foundry was built which is one of the few in Europe which makes American blackheart malleable.

A delegation headed by Herr Clette was sent to Rostoff, Don, by Krupps on March 19, to negotiate for the agricultural lease. Prior to the arrival of the Germans a telegraphic message from high authorities in Moscow was received at Rostoff directing the local authorities to assist the Germans.

German Trade Is Regaining Activity

European Special Correspondence

DUSSELDORF, Germany, June 22.—The stagnation in business, caused by the conferences at Genoa and Paris, is at an end and although the German exchange is falling further, business is regaining activity. Demand, especially from the inland is growing and export inquiries are more numerous. Prices are firmer and show a tendency to rise as further increases of the fuel prices are in view. In consequence of the fact that the wages for the coal miners have been increased by 35 marks ($0.11) per shift from July 1 on, it is certain that at the same date the fuel prices shall be increased by another 100 marks

Mark—$0.0032

($0.32) per ton. Coal miners again have declined to do extra hours. Thousands of coal miners are leaving the pits in order to get better wages in the building trade.

Scrap is firmer and in demand. Heavy inland foundry scrap is quoted at 5000 marks ($16.00) per 1000 kilos free at sellers works. English mild steel scrap of heavy size remains at about 68 shillings per ton c.i.f. Rotterdam.

Ore is firmer and in demand; prices are considered to be at the rock-bottom. Inland ore-production is decreasing. The heavy imports of French, Belgian and Lorraine semifinished and mill products including bar iron and structural shapes, continues. Merchants quote for deliveries of bar iron from their stocks 1370 marks ($4.38) per 100 kilos for Westphalian product and 1575 marks ($5.04) per 100 kilos for Lorraine product. The latter price is willingly paid because these stocks contain any dimension, while in Westphalian bar iron, only a few dimensions are in stock and those in small quantities.

Japan Buys American Rail Equipment

TOKIO, Japan, June 22—A change for the better is noted in the Japanese iron and steel market owing to the improvement in the credit situation due to the assistance rendered by the Japanese government and the Bank of Japan. Credit is much easier as a result, and few sellers in the iron and steel market are as anxious to liquidate as they were a few weeks ago. A greater degree of stability is observed with regard to prices of pig iron and steel products. Sellers quote No. 1 Japanese at 70 yen ($32.90) per ton; No. 2, 65 yen ($30.55) and No. 3, 60 yen ($28.20), though the quotations are nominal. No. 1 Hangyang, Chinese, pig iron can be had at 65 yen ($2.21) per 10 kwamme; square 60 to 61 yen ($28.50 to $28.67) and No. 3 Cleveland, British, at 78 yen ($36.66) per ton.

Round steel bars are quoted at 4.70 yen ($2.21 per 10 kwamme; square bars 5 yen ($2.35); flat bars 5.10 yen ($2.40); plates 4.50 yen ($2.11) and sheets at 7.30 yen ($3.43) per 10 kwamme. The kwamme is the unit of trade in Japan; 10 kwamme equals 86.67 pounds.

The volume of business is falling off steadily and at present only small lot trading is reported. Hardly any line is consuming iron and steel at present in accordance with expectations. Petroleum refiners have been buying large lots of tin plate but owing to keen competition with the importers of foreign ore they are unwilling to take any more at current prices. Importers of tin plate are unable to reduce their figures, they say, owing to the advancing tendency in American prices.

According to an official report importation of finished steel in May amounted in value to 14,589,000 yen

Yen—$0.48

compared with 12,582,000 yen in May 1921. Nails imported in May were valued at 1,290,000 yen, compared with 233,000 yen in May 1921.

The government railways of Japan have followed the action of two private railways in starting to electrify their lines. The government has placed orders for electric locomotives, steel sleepers, heavy rails and other equipment with American makers through agents here. It is now announced that more orders soon will be given. Work is to be undertaken on a big scale and importers are attentive to government plans.

German Industry Lacking Improvement Signs

German industry, according to C. E. Herring, commercial attache at Berlin, now is confronted with a discouraging outlook. The 25 per cent increase in freight rates, rising coal prices and higher wages are some of the factors contributing to production costs. Moreover foreign orders are decreasing and cancellations are tending upward which is explained by the approach of German prices to the world market prices. The domestic market has been affected by overpurchasing which has been characteristic of the German inland market for many months. Competition of an increasing number of foreign manufactured products in the German market is prevented by recent increases in import duties and by a stricter enforcement of the import embargo.

Germany according to Mr. Herring realizes an improvement in the external value of the mark or even a stabilization at its present level may bring an industrial slump. Half-speculative foundations exists under the present industrial activity and temporary advantages of fresh currency depreciation are progressively less apparent. The concensus of opinion in Germany is veering toward a large international loan but there is no constructive program for convincing the unsentimental lending public of foreign countries that the loan will be secured adequately.

Ruhr coal production for 19 working days in May amounted to 5,600,000 tons; Ruhr coke to 1,475,000 tons. Upper Silesian coal production was larger in May than April. A coal shortage is hindering and a shortage of pig iron makes imports necessary. The slowness in deliveries on steel is making an unsatisfactory impression on foreign buyers. Foreign demand for rolled materials is quieter while Belgian and British competition is preventing the export of black sheets and wire rod exports are threatened.

Reorganize Engine Plant

Reorganization of the Midwest Engine Co., Indianapolis, manufacturer of engines and small tractors, and adequate working capital for the company are assured by the receipt of subscriptions totaling $1,000,000 to refunding bonds, it has been announced by the receivers. The reorganization plans call for change in the name of the company to the Midwest Engine Corp. The reorganized corporation will authorize the issuance of $4,500,000 of preferred stock which will go to the creditors of the defunct organization. It will have 125,000 shares of common stock of no par value. These shares will go to the preferred stockholders of the old company.

Agricultural Outlook Promising

Excellent Crops Are in Prospect—Farm Products Prices Rising and the Purchasing Power of the Farmer Is Higher Than in 1921—Country Bank Loans Liquidated—Freight Rates Are Cut

BY JOHN W. HILL, FINANCIAL EDITOR

PROSPECTS for rising agricultural prosperity constitute one of the most encouraging phases of the business outlook for the last half of the year. The present promise of a heavy demand for goods in the farm states in the fall, coupled with other important factors of strength in the situation, largely overshadow the adverse possibilities growing out of labor troubles and European conditions.

One year ago farm products would buy only 72 per cent of the amount of other commodities they commanded in 1913. Today, with the rise of farm products from the low point of 17 per cent above 1913 to 32 per cent above, their purchasing power stands at 85 per cent. The recent decline in wheat price has been a speculative movement of little concern to the farmer because only about 5 per cent of last year's crop remains on the farm. The new crop has been produced more cheaply than that for 1921 or 1920 and prices are not likely to sink below a profitable level.

Not only in the matter of prices are the farmers in a better position, but virtually all crops promise better yields this year than in 1921. In the chart on page 28 of the BUSINESS TREND SECTION in this issue, the small grain situation is pictured graphically, from 1914 to 1921, and the yields forecasted by government experts in the estimate for June 1 of this year. The horizontal bars show the annual average yields of oats, barley, wheat and rye for the five-year period of 1909-13, the actual yields for the years

Index to Business Trend Charts

THIS ISSUE

Subject	Page
Iron and Steel Price Index	25
Foreign Exchange	26
Railroad Freight Traffic	26
Steel Foreign Trade	26
Alien Migration	27
Freight Factor	27
Commodity Prices	27
U. S. Crop Production	28

REFERENCES

Building Cost Index	June 29
Security Prices	June 29
State of Credit	June 29
Foundry Pig Iron Market	June 29
Iron and Steel Production Rate	June 29
Independent Sheet Situation	June 29
Cotton Consumption	June 29
Bank Clearings	June 29
Structural Steel Awards	June 29
Monthly Business Index	June 22
Unfilled Steel Orders	June 22
Automobile Production	June 22
Foreign Trade	June 22
Employment Comparisons	June 22
Building Construction	June 15
Car Orders	June 15
Coal Production	June 15
International Steel Market	June 15
Pig Iron Index	June 15
Prices and Failures	June 15
Railroad Earnings	June 15
Copper Prices	June 8
Steel Output Per Capita	June 8
Wholesale and Retail Prices	June 8
Farmer Purchasing Power	June 1
Wage Factor	June 1
Iron and Steel Price Parity	May 11
Dollar Purchasing Power	May 4
U. S. Steel Corp. Earnings	May 4
112 Years of Prices	March 30

in nearly all cases the estimated yields not only exceed 1921, but are far ahead of 1913. The total indicated harvest of small grains this year is 2,432,000,000 bushels. This is 17 per cent more than in the preceding year and 19 per cent greater than the pre-war average. Spring wheat prospects are 18 per cent better than the 1921 yield. This improvement is shown in spite of the fact that the average given over to small grains is 2.8 per cent smaller than in 1921. Greater use of fertilizer, ample labor and better weather conditions are reflected.

The larger crop prospects do not promise any over supply of food. The 1921 carryover is smaller than one year before. In addition, Russia's withdrawal as a food exporting country compels the European nations to buy American food. Better employment and more purchasing power in the industrial centers probably will increase the consumption of food products. The financial conditions in farm sections are normal. Federal reserve banks in the agricultural districts are no longer leaning upon the Eastern regional banks. Farmers have liquidated their frozen loans and country banks are in excellent shape to handle the coming crops.

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	382	391	407	.....	300
Cash Ratio Fed. Res. system..	77.5	79.1	78	60.8	.....
Loan rate, 4-6 months, N. Y. (per cent)....	4	4	4¼	6½-6¾	5¼-6
Aver. 20 Ind'l. shares	$89.81	$89.77	$93.39	$66.18	$75.00
Aver. 20 Rail shares	$84.42	$83.41	$84.81	$70.85	$104.50
Aver. 40 bonds	$79.95	$79.95	$80.04	$68.58	$93.00
Car loadings (week ended June 17).....	860,722	846,002	792,459	775,258	*916,686
Bank debits 165 cities (000 omitted)	$8,613,000	$9,403,445	$7,315,041	$7,000,000	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	July 1 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.42	$4.40	$4.50	$3.73
Francs	19.3c	8.39c	8.32c	9.13½c	8.01c
Lira	19.3c	4.70c	4.67c	5.22c	4.89c
Marks	23.8c	0.254c	0.29c	0.35c	1.32c

*Monthly average export prices. †April.

MONTHLY COMPARISON

	June	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$362,590,000	$353,192,000	$241,000,000	$71,450,000
Business failures: Number	1960	2167	1356	1336
Liabilities	$44,402,886	$73,058,637	$57,066,471	$22,723,000
Excess of exports	$54,000,000	$104,000,000	$124,798,393	$54,406,000
Excess of gold imports	$5,587,339	$10,630,000	$57,108,865	*$630,716
Bureau of Labor Price Index....	148	143	145	100
Bradstreet's Price Index	129.2	127.0	115.2	100
Economist's British Price Index....	4372	4285	4910	2717
Cost of Living Index	154.8	154.7	167.6	100
New incorporations	$938,195,000	$792,372,000	$601,000,000	$172,301,000
Railroad net earnings	$60,880,000	$50,256,800	$37,081,000	$59,900,000

The Business Trend

July 6, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Country's interest centered upon developments in labor crises; feeling prevails that government will avert serious railroad tieup and cause settlement of coal strike; pulse of trade displays no weakness, though seasonal summer lull may come.

FREIGHT TRAFFIC—Loadings for week ended June 17 largest since last fall; merchandise shipments exceed 1921 by 105,000 cars; idle cars fewer and car shortage probable.

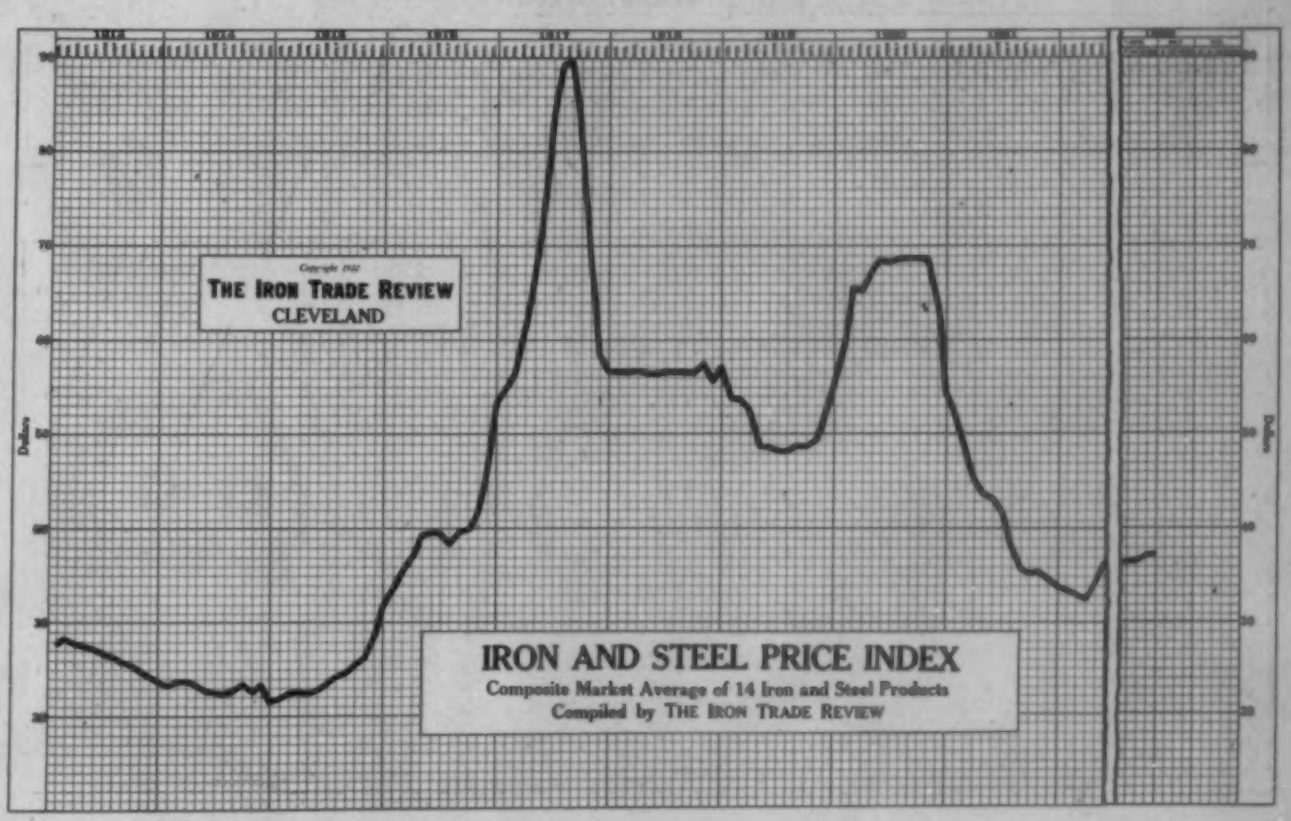
FOREIGN EXCHANGE—Sterling fairly firm; francs and Italian lire gain fraction over recent low levels; marks sink to new low record; European situation unfavorable.

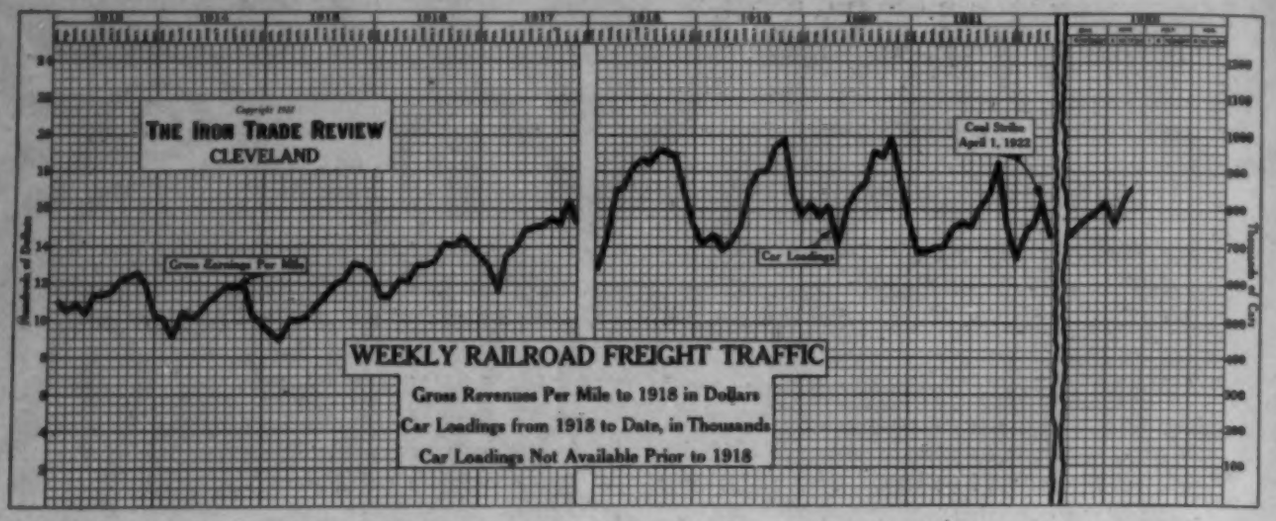
MIGRATION—May and June excess of alien immigration, averaging 12,000, shows slight increase over previous months; immigration restrictions seriously complicates labor shortage.

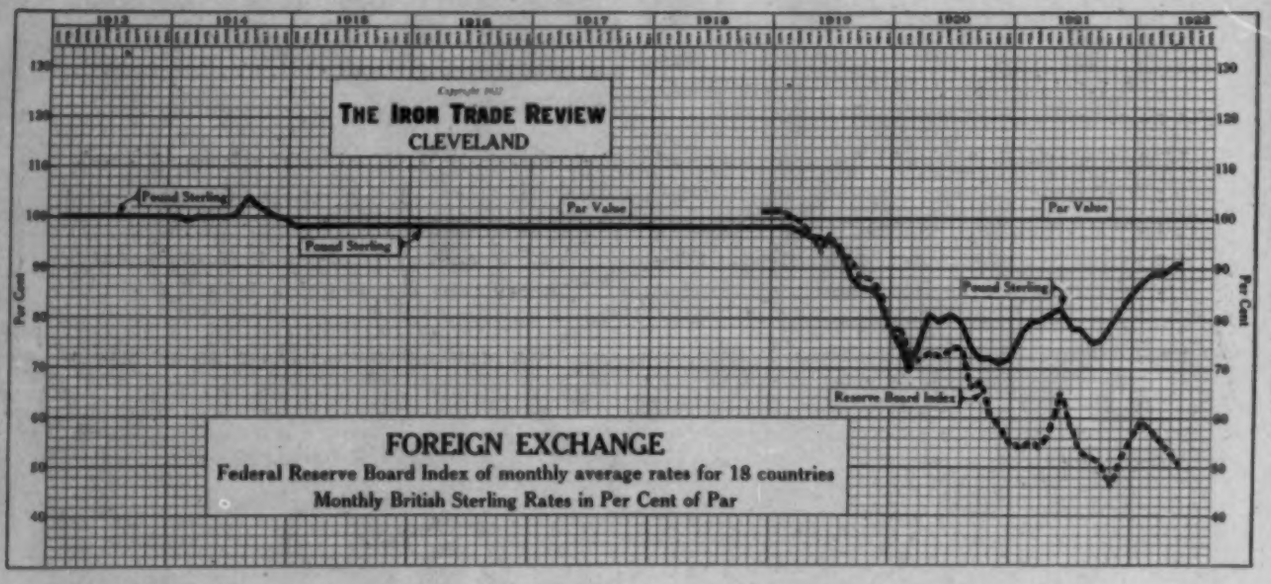
STEEL FOREIGN TRADE—May exports of 229,616 tons of iron and steel greatest in 15 months; gains in many products; imports make third monthly increase.

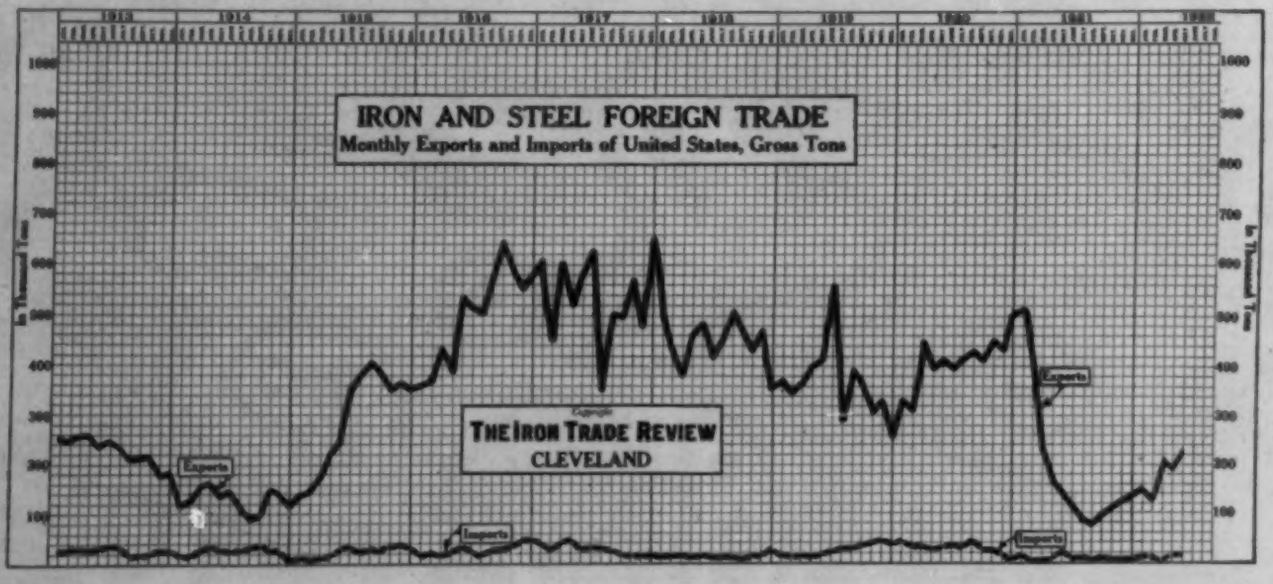
COMMODITY PRICES—Revised wholesale price index of U. S. labor bureau shown in chart; rises from 143 in April to 148 in May; steel prices pass farm products in advance.

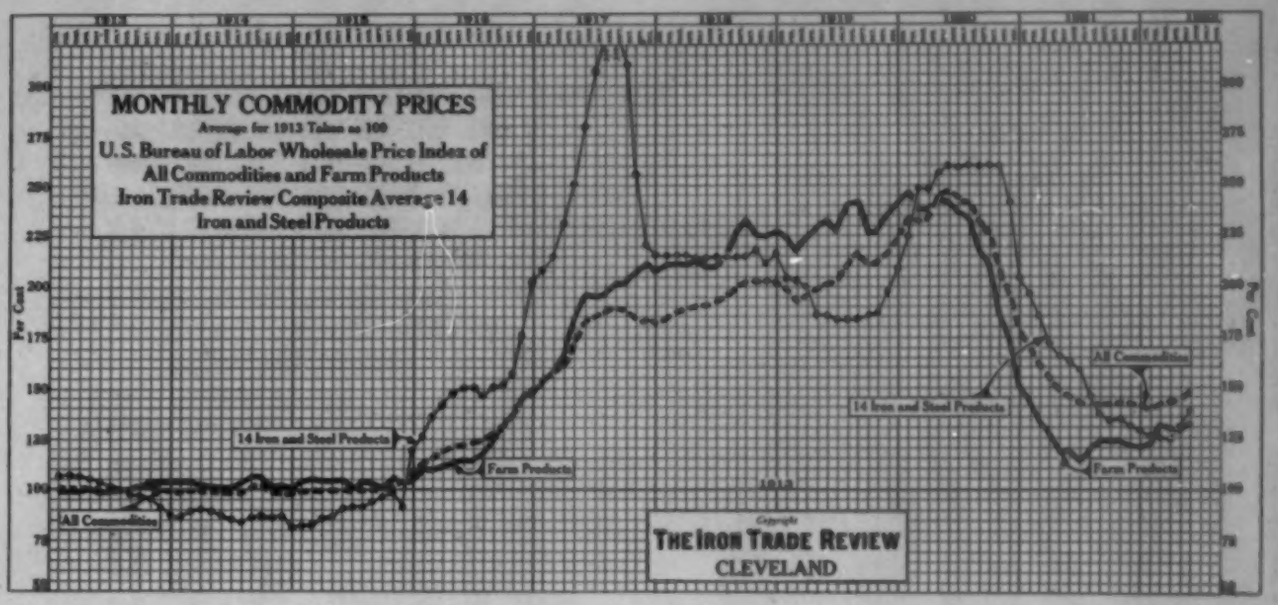
FREIGHT RATES—Freight cost for material to make one ton of iron now $8.03 against $9.16, Jan. 1 1922; $9.95 at peak in September, 1920; and $4.93 in 1913; 10 per cent cut effective July 1.

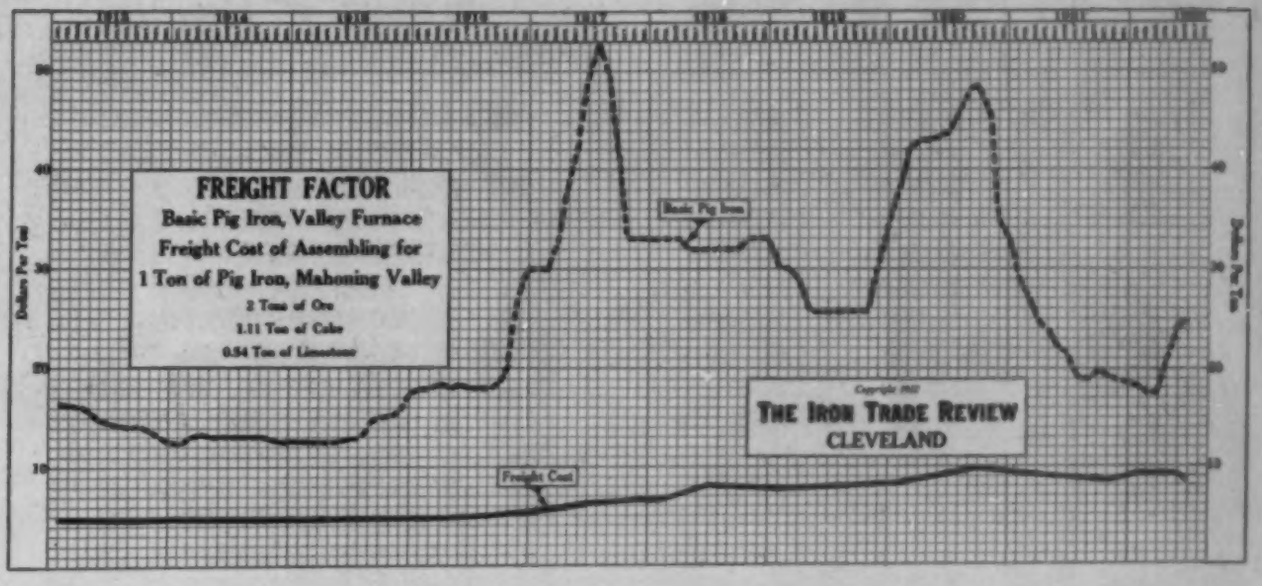

Copyright 1922
THE IRON TRADE REVIEW
CLEVELAND
IRON AND STEEL PRICE INDEX
Composite Market Average of 14 Iron and Steel Products
Compiled by THE IRON TRADE REVIEW

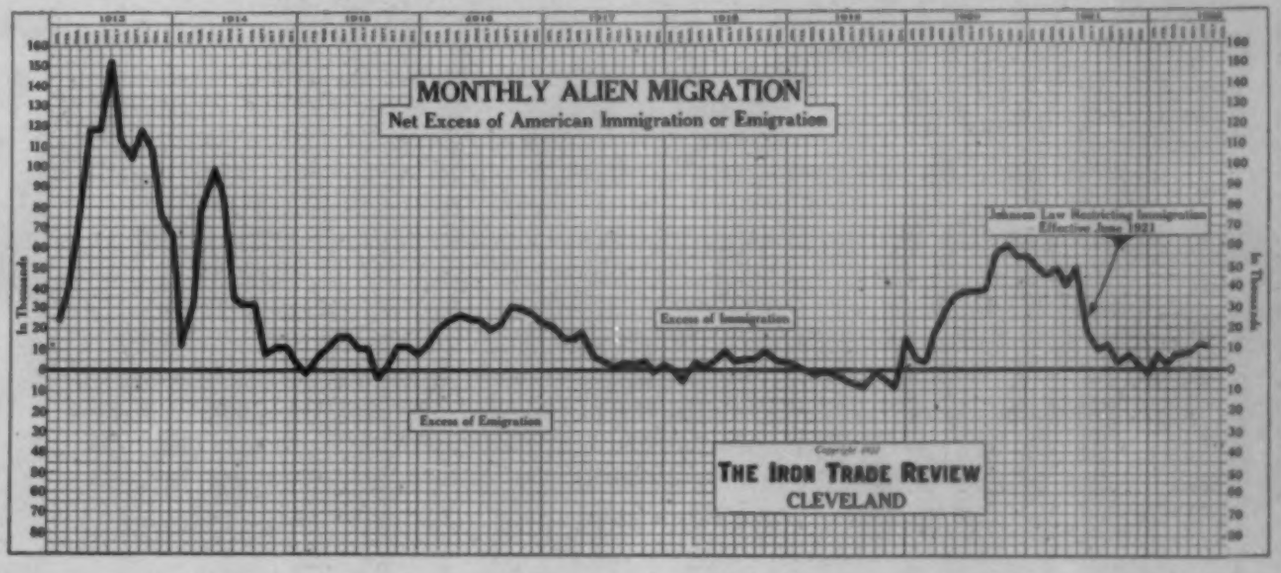

Copyright 1922
THE IRON TRADE REVIEW
CLEVELAND
Gross Earnings Per Mile
Car Loadings
Coal Strike April 1, 1922
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918

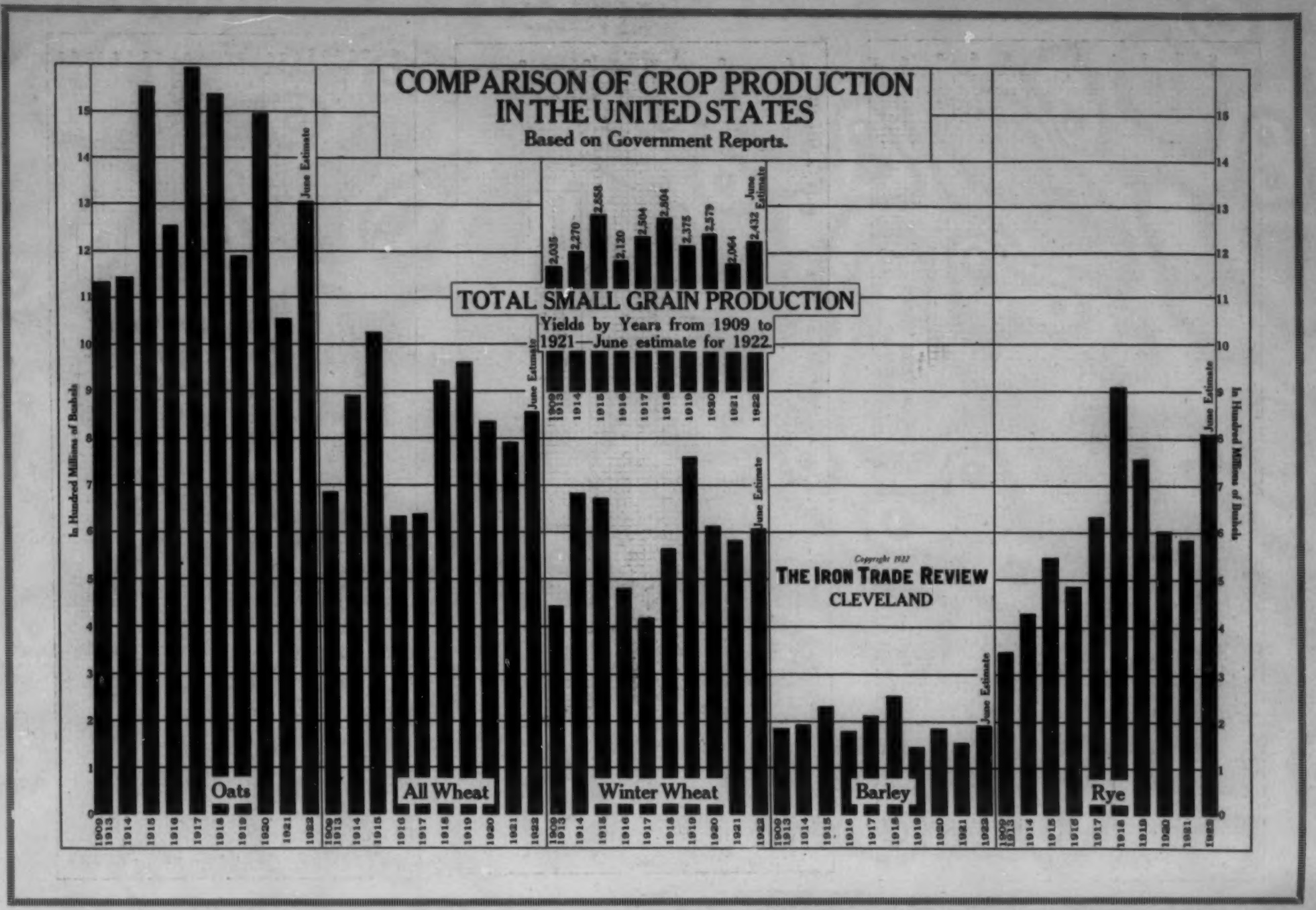

Copyright 1922
THE IRON TRADE REVIEW
CLEVELAND
Pound Sterling
Par Value
Pound Sterling
Par Value
Pound Sterling
Reserve Board Index
Per Cent
FOREIGN EXCHANGE
Federal Reserve Board Index of monthly average rates for 18 countries
Monthly British Sterling Rates in Per Cent of Par


IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States, Gross Tons
Copyright
THE IRON TRADE REVIEW
CLEVELAND
Exports
Imports
Exports
Imports
In Thousand Tons


MONTHLY COMMODITY PRICES
Average for 1913 Taken as 100
U. S. Bureau of Labor Wholesale Price Index of
All Commodities and Farm Products
Iron Trade Review Composite Average 14
Iron and Steel Products
Per Cent
14 Iron and Steel Products
Farm Products
All Commodities
1913
Copyright
THE IRON TRADE REVIEW
CLEVELAND


FREIGHT FACTOR
Basic Pig Iron, Valley Furnace
Freight Cost of Assembling for
1 Ton of Pig Iron, Mahoning Valley
2 Tons of Ore
1.11 Tons of Coke
0.54 Ton of Limestone
Dollars Per Ton
Basic Pig Iron
Freight Cost
Copyright 1927
THE IRON TRADE REVIEW
CLEVELAND


MONTHLY ALIEN MIGRATION
Net Excess of American Immigration or Emigration
In Thousands
Johnson Law Restricting Immigration
Effective June 1921
Excess of Immigration
Excess of Emigration
Copyright 1927
THE IRON TRADE REVIEW
CLEVELAND


COMPARISON OF CROP PRODUCTION
IN THE UNITED STATES
Based on Government Reports.
TOTAL SMALL GRAIN PRODUCTION
Yields by Years from 1909 to 1921—June estimate for 1922.
2,035
2,270
2,858
2,120
2,504
2,804
2,375
2,579
2,064
2,432
June Estimate
In Hundred Millions of Bushels
In Hundred Millions of Bushels
Oats
All Wheat
Winter Wheat
Barley
Rye
June Estimate
Copyright 1922
THE IRON TRADE REVIEW
CLEVELAND

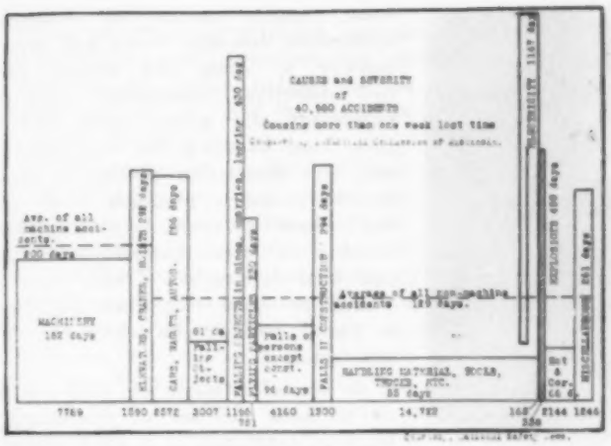


Fig. 1—Causes of 40,980 accidents as compiled by the Industrial Commission of Wisconsin and published by courtesy, *National Safety News*.

SUMMARY OF ACCIDENTS - 1921 & 1922

PALMER AND GODDARD WORKS
Wickwire Spencer Steel Corporation

	PALMER WORKS				GODDARD WORKS			
Cause	No.	%total	Days Lost	%total Days Lost	No.	%total	Days Lost	%total Days Lost
Machinery	61	36.3	1025	36.8	16	24.6	49	24.5
Handling Material	28	42.7	798	28.8	39	29.6	807	40.4
Falling Objects	14	18.2	500	18.0	8	12.3	141	7.1
Falls	2	2.3	69	2.0	7	9.8	300	15.2
Miscell.	3	2.7	381	13.6	6	10.2	124	7.8
Total	68	100.0	2768	100.0	72	100.0	1745	100.0

Fig. 2—Summary of accidents in 1921 and 1922 in the Palmer and Goddard works of the Wickwire Spencer Steel Co.

Making Material Handling Safe

Greatest Number of Industrial Accidents Occur in the Handling of Material—Use of Proper Trucking and Conveying Equipment Is Aid to Safety—Discipline and Morale Are Essential Factors

BY VERNON C. KING

WHEN the subject of accident prevention is mentioned one almost instinctively thinks of high speed machines and automobiles. While it is true that the most serious injuries come from these two sources, the greatest number of accidents occur in the handling of material. This is shown in Fig. 1, which was prepared by the industrial commission of Wisconsin and published in the *National Safety News*. It clearly proves the seriousness of accidents in handling material and shows that 36 per cent of the total number of accidents are from this cause. The report of Massachusetts Industrial board showed 27 per cent in 1918 and 26 per cent in 1919, with time lost on account of this class about 12 per cent.

Fig. 2 shows a summary of the accidents to employes at the Palmer and Goddard works of the Wickwire Spencer Steel Corp. These figures cover a period of two years with an average of 747 employes at Palmer and 878 at Goddard. The rates of accidents chargeable to handling materials is even greater than shown in Fig. 1, which may be accounted for by the heavy and bulky nature of material handled.

In making this classification of accidents it was difficult to draw a hard and fast line. Some of those classified as "falling object" accidents or even "falls" might have been legiti-

From a paper recently presented before the Worcester, Mass., section of the American Society of Mechanical Engineers. The author is safety engineer, Wickwire Spencer Steel Corp., Worcester, Mass.

FIGS. 3 AND 4—"IF YOU USE A DEVICE ON A TRUCK ENABLING ONE MAN TO HANDLE A BARREL OTHERWISE REQUIRING THREE MEN, YOU DECREASE THE POSSIBILITY OF ACCIDENT 66⅔ PER CENT"

FIG. 5—AN INSUFFICIENT NUMBER OF LOADING PLATFORMS ENCOURAGES OVERLOADING. THE WOODEN PLATFORM COLLAPSED FOR THIS REASON. STEEL PLATFORMS HAVE REPLACED THOSE OF WOOD IN THIS PLANT

mately charged to handling material. For example, a mason's tender walking along a staging with a hod of bricks on his shoulder trips and falls from the staging and a brick hits another workman on the head. Is this chargeable to handling material, falling objects or falls? This accident is not included in the above data under handling material, indicating that the large charge against this class is conservative.

These figures should be sufficient to prove that we have a real engineering problem in the safety phase of handling material as well as on the economic and productive sides; in fact this is one factor entering the economic solution of the material handling problem.

It would be impossible to work out a formula for the solution of this problem but there is one principle to keep in mind and that is that the elimination of men decreases the possibility of accidents. For example, if one man can handle a barrel of goods with the proper type of truck where three men are required with an improper truck, the possibility of accident is decreased 66 2/3 per cent by using the right truck. The right and wrong ways are illustrated in Figs. 3 and 4.

Causes of Accidents

An analysis of the problem by study of the accidents from which the previous summary was made divides itself into two main divisions. The first is material and the second personal.

Under the material division we have three subdivisions, namely, lack of equipment, defective equipment and poor system or methods. The personal division, which is the more important, includes such causes as ignorance, negligence, carelessness, discipline, poor housekeeping and one of the most important, lack of co-operation.

FIG. 6—NAILS REMAINING IN A BARREL AFTER THE HEAD HAS BEEN REMOVED CONSTITUTE A MENACE TO OTHER WORKMEN

Lack of equipment is conducive to the overloading of the equipment on hand, which results in weakened equipment, damaged floors and greater liability to spills and further leads to defective equipment. Defective equipment also means spills and injury from handling the equipment itself. An illustration of this is shown by the wooden platform used with the elevating truck. An insufficient number of these caused overloading and final destruction. These were replaced by steel platforms, as shown in Fig. 5, with results which are very satisfactory.

As an illustration of poor system or methods the use of miscellaneous sizes of toteboxes is a good example. As indicated in Fig. 7, it is impossible to stack these in a safe manner. They are more liable to spill and are more easily destroyed with the ever dangerous protruding nail present in the process of destruction. A uniform dovetailed box not only stacks well when full, but stacks in from one-third to one-half less space when empty. Neat stacks of uniform boxes are shown in Fig. 8.

Human Element Present

Turning to the human equation in connection with this problem, one of the most important factors is ignorance. It has been a common opinion among foremen and superintendents that anyone of the lowest intelligence can handle material and perhaps that is one reason why so many accidents occur in this section of industry. Under those accidents charged against handling materials 75 per cent involve foreign speaking workmen. They are unable to read instructions, but fortunately the National Safety council is issuing illustrated bulletins, many of which drive home a lesson. Many strains and ruptures are caused by lack of knowledge of the proper

FIG. 7—WHEN TOTE BOXES OF MISCELLANEOUS SIZES AND SHAPES ARE USED, VALUABLE SPACE IS LOST AND THE DANGER OF ACCIDENT IS INCREASED

method of lifting or stacking material and likewise many infections are the result of not understanding the importance of first aid and the advantages of proper hygiene.

Injuries may be caused by negligence—first on the part of the employer for not having proper and sufficient equipment, secondly on the part of the foreman for not properly instructing the workman or for failing to provide sufficient help, and thirdly on the part of a fellow workman who does not complete his part of the task as when he removes a barrel head and carelessly leaves nails protruding in the barrel, as shown in Fig. 6.

Accidents caused by riding on trucks must be charged up against handling material even though the injured person be a wire drawer or sweeper, because the accident was caused by apparatus required to move material. Here lack of discipline is directly responsible and this is in the hands of the foreman. The rules are that a careless workman must be discharged and the foreman who keeps a careless operator, even though he be a good workman, lacks the discipline necessary to safely handle materials in a plant.

Orderliness Is Prized

Good housekeeping is a virtue and counts heavily in the prevention of accidents. Since handling material takes in every part of the mill and those engaged in this work cover several miles each day, poor housekeeping is responsible for more accidents under the classification of handling material than in any other class. By good housekeeping we mean a place for everything and everything in its place. The handling of scrap material is an important item in good housekeeping and accident prevention. Scrap should be removed from around machines as often as possible and put in shape to be easily carted away. Scrap in itself generally is dangerous material to handle so that suitable equipment should be provided for baling. Edge trimmings form a bulky material which is dangerous to handle before it is baled into rolls for convenience.

FIG. 10—EDGE TRIMMINGS AND SIMILAR SCRAP IS DANGEROUS AT THE BEST, BUT THE BALES SHOWN HERE ARE PREFERABLE TO THE LOOSE MATERIAL

FIG. 9—STRONG, LIGHT GANGWAYS LEADING FROM CAR TO PLATFORM ARE VALUABLE AIDS IN HANDLING MATERIAL

Co-operation, which is so often a negative factor in this human equation, is one of the most important. In looking for lack of co-operation, as the cause of accidents under discussion, the writer was able to find at least one example of it between foreman, first-aid department, safety engineer, repair departments, workmen and in fact almost all elements of the organization. However, perhaps most directly responsible for injuries is lack of co-operation or perhaps lack of co-ordination between workmen on a crew, for example a crane operator and men handling annealing pots. This is usually found in a new crew, or when a green man is introduced to an old crew. This indicates that large labor turnover is dangerous in handling material as well as in machine operation.

Safety Features Important

In conclusion the author believes that whatever type of equipment is selected for handling material, due consideration should be given to all safety features. The greatest attention should be paid to the human equation and this can best be reached through the employment and service departments and the foremen. This is largely a matter of education and propaganda in which the foreman is instructor and propagator. Much may also be done through bulletins, the shop paper, safety committees, and Americanization classes. The formation of an internal traffic department simplifies the safety problem so far as moving material is concerned but practically every machine operator handles material. In some factories many of them handle several thousand

FIG. 8—DOVETAILED WOOD BOXES OF UNIFORM SHAPE AND SIZE ARE EASILY STACKED AND WHEN EMPTY CONSERVE STILL MORE SPACE

pounds per day, so that this process of instruction and education cannot be confined to a department but must be general throughout industry.

Iron Mining in Manchuria 1000 Years Old

"When the Russians laid the railway from Harbin to Dalny, Port Arthur, they had no inkling of the An-shan iron belt in spite of the fact that the railway track crosses the middle of it; and on account of the low grade of the 'iron-containing rock' they used it only for railway ballast." Thus begins an interesting chapter on the history of the iron ore industry in Manchuria, contained in the book "Geology of the An-shan Mine District," published recently by the South Manchuria Railway Co. The writer, Hanzo Murakami, geologist for the company, proceeds to say:

"In the year 1909 the geological survey conducted by the South Manchuria Railway Co. established the true value of iron ore at Tieh-she-shan, literally meaning the 'mountain of ironstone.' Generally the Chinese geographical names tell something about the geological peculiarities of the place. After the discovery the company continued to explore the district more and more and had the delightful surprise of discovering the wonderful distribution of the iron, and now a fairly definite idea of the distribution of the ore is known. This iron wealth lay neglected for a few years, partly because of the difficulty of acquiring the necessary concessions and partly because of the low economic value of the ore. During the war the necessity for a 'local' of iron in Japan was strongly recognized, and by May, 1919, two blast furnaces with a capacity of 250 tons a day each were completed in An-shan.

"When mining was started it was astonishing to find many openings which no doubt once served as pits, excavated by primitive methods, having a depth of about 60 feet. Evidently the ore was mined in ancient times. Many pieces of old slag with charcoal and bones of mammals employed for smelting purposes were found.

"From 'The History of the Liao Dynasty,' Vol. 60, written in Chinese, one may infer that the primitive mining mentioned dates back about 1000 years, and that Tai-tsu, the founder of the Liao dynasty, took no little interest in mining work, especially in iron smelting, in the years 616-721, or in the Shen-tse era. It is recorded also that there was at that time a tax collector's office for levying taxes on the iron-works at Liao-yang, 15 miles north of An-shan, and that the tax was paid in iron produced. At Shou-san, 9 mines north of An-shan, a blast furnace was constructed surrounded with about 300 houses for the residence of those engaged in the smelting industry. We may gather that the mining in the vicinity of An-shan was very prosperous in ancient times."

The An-shan district extends over 37 miles from east to west, and is called

FIG. 11—CO-OPERATION BETWEEN THE MAN IN THE CAB AND THE MEN ON THE FLOOR IS A GUARD AGAINST ACCIDENTS

"the store-house of iron in South Manchuria." The deposits are abundant, though not very high in quality. The formation has many points of similarity to that of the Lake Superior district. The writer does not estimate the tonnage of the various grades. He says there is not enough of the secondarily enriched ores to charge continuously the "capacious furnace of the An-shan steelworks, and it is therefore necessary to depend more upon the abundant primary ores, hematite-quartz-schist." Since the latter is lean in iron content, containing 35 per cent or less, it must be concentrated, and investigations are now under way to determine if a practical method can be found for concentrating the hematite-quartz-schist by magnetic means.

Belgian Standardization Is Progressing

Standardization progress particularly in the construction, metals, mining, and electrical industries of Belgium are indicated in a report from the Association Belge de Standardization which has been received recently by the American Engineering Standards committee. The following standards have been approved for issue:

Rules for the construction of steel roof trusses, steel tanks galvanized, corrugated roofs and partitions; steel bridges; tentative list of equal angles; shafts and pulleys; bolts and rivets; electrical machinery; electrotechnical vocabulary.

The report also shows that the following proposed standards have been published for criticism:

Rules for the design and inspection of reinforced concrete structures; chains; wire cables for cranes, hoists, elevators and mining purposes.

To Aid Building Industry

Problems which are suggested for the new American Construction council, of which Franklin D. Roosevelt is president, includes the formation of a code of ethics acceptable to the whole building industry to the public, co-operation in the establishment of uniform building codes throughout the country, simplification, standardization, elimination of waste, co-operation with the railroads in revising rates on building material, and reduction of the national shortage of building trades mechanics and establishment of the necessary apprentice system. The engineers placed on the executive board of the council are Charles T. Main, Boston; Bion J. Arnold and Charles F. Loweth, Chicago; and Peter Junkersfeld, New York. The material and equipment manufacturers on the board are Wright D. Goss, New York; F. W. Walker, Beaver Falls, Pa.; W. M. Wood, Decatur, Ill., and William Ritter, Columbus, O.

May Automobile Output Sets High Record

United States department of commerce figures show an increase in May in the production of passenger automobiles and trucks. The total production of passenger cars in May, so far reported, amounted to 231,699, compared with 197,221 in April. This is an increase of nearly 18 per cent. The total truck production in May was 24,603 machines, compared with 22,227 in April.

Reports have been received this month from a number of companies which have not reported previously. This has necessitated a revision of the figures for earlier months. For the month of May 91 companies have reported on passenger car production and 82 companies on trucks. With a few exceptions the following table represents the production of identical firms for each month:

1922	Passenger cars	Trucks	Total
January	81,693	9,344	91,037
February	109,170	13,121	122,291
March	152,959	19,651	172,610
April	197,221	22,227	219,448
May	231,699	24,603	256,302
Total	772,742	88,946	861,688

Developing an Electric Furnace

Experience in Application of Electrometallurgy Shows Certain Definite Conditions Must Be Met in Designing Efficient Melting Unit—Factors Involved Are Discussed—New French Furnace Is Described Briefly

BY R. SYLVANY

BECAUSE of the greatly increased application of electrometallurgy, fresh attention has been directed to the different types of electric furnaces capable of being successfully employed for melting and refining metals. The furnace described in this paper, the idea of which is due to T. Levoz, a French metallurgist, presents certain interesting features, and illustrates one of the latest French developments in this field. The use made of it during the war for the production of high speed steel demonstrated the principles on which it is constructed and which we shall briefly describe.

The refining of a steel bath is effected by the action of the slag, of a fixed composition, on the molten metal. This action is made up of several reactions which require for their realization certain conditions already laid down by Prof. Campbell in the course of a meeting of the British Iron and Steel institute, when the first practical trials of electric furnaces were being made.

The slag must be brought to a high temperature, as this temperature and the resulting fluidity combine in facilitating the refining reactions. The rapidity of these reactions, indeed, increases with the temperature, the increase being much more than proportional. Great fluidity maintained in a basic slag and the formation of calcium carbide by the action of the arc upon the limestone slag are two conditions which favor desulphurization. Thorough rabbling of the bath also is indispensable, as it is necessary that every part of it in succession shall be brought in contact with the slag so that it may free the metal of its impurities. This rabbling must be secured by a suitable distribution of the current.

For this reason Prof. Campbell laid stress upon the following important points, the realization of which appeared to him essential:

The furnace should be closed as much as possible and should be of the simplest possible construction; the furnace should be of entirely separated from the electric fittings of the generators and transformers, which should be maintained at their highest capacity in order to increase the power of the installation; the wear of the refractory materials of the linings should be saved by applying the heat at the center of the bath, and those of the roof by protecting them from the direct radiation of the arc by the electrodes themselves, the slag should be given as large an area as possible so as to increase the refining surface; and the temperature of the slag should be maintained above that of the steel, so as to secure fluidity and facilitate the high basicity required by an intensive process.

Prof. Campbell also advised the use of a homogeneous and solid hearth, and with this in view, recommended that electrodes should not be allowed to pass through it. On the other hand, Dr. W. Borchers, who was one of the pioneers of electrometallurgy, was speaking of the satisfactory results obtained by this latter type of furnace. The principle of this, the Girod furnace, was based on a combination of the resistance arc furnace. The metal to be melted constituted one of the electrodes, the slag covering it forming an electrolytic conductor, the metal constituting the resistance and the current being distributed by one of several carbon electrodes traversing the roof and by multiple contacts passing through the bottom. There was no question of the solidity of this furnace. The advantages arising from a uniform distribution of the current, effected by the arrangement of the contacts passing through the bottom, constituted one of its essential characteristics, namely that of insuring the efficacy of the furnace's refining action.

The section and length of these contacts were such that no one of them could carry more than a certain fraction of the total current without becoming overheated and, consequently, without its resistance being excessively increased. The regulation of the temperature and resistance of each contact was effected by cooling the hollow extremities by a water circulation system. Certain inconveniences were thus remedied, and as a result of the uniform arrangement of the contacts round prolonged axis of the carbon electrodes the advantage of a uniform rabbling of the bath was obtained. Professor Campbell's one objection thus disappeared; moreover, the results already obtained at that time demonstrated the furnace's merits.

When regularly working, the lining, which was chiefly composed of burned dolomite, withstood at least 80 heats. The bottom of the furnace stood 120 to 160 heats without repair and had then lost 100 millimeters in thickness. With charges of molten metal the lining could stand 200 operations, and the roof about 20 to 35. The wear of the other parts of the furnace was comparatively slight and the consumption of carbon electrodes was from 12 to 15 kilograms per ton of steel.

The principle adopted in the Girod-type furnace, which was also to be adopted in the Keller-type furnace with a better distribution of current, thus marked an advance in the construction of electric furnaces.

In the Keller-type furnace the distribution of the current in the bath, instead of being merely carried round a certain number of contacts, was effected over the whole depth of the bath by means of a bundle of iron bars surrounded by refractory clay which formed the furnace bottom. The current was introduced by a large carbon electrode rectangular in section.

As in the Girod-type furnace, the intensity of current necessary was high, as it had to reach 3000 amperes; but this high intensity had fewer disadvantages as the current was better distributed and the electric resistance in the large single electrode and in the conducting hearth was not as great. The difficulty of water cooling and of overheating of the carbon electrodes was avoided. The principles laid down by Professor Campbell therefore were observed in this fur-

Capitalizes Experience of the Past

BEGINNING with a statement of the fundamental principles governing the design of electric melting furnaces, the author of the accompanying article shows how these principles have been interpreted by the designers of several French furnaces. In conclusion he describes how certain metallurgical considerations were applied to a recently developed French electric furnace. The article is from a paper presented at the twenty-sixth meeting of the American Foundrymen's association, Rochester, N. Y., June 5-9. It was made available to the association through the courtesy of the Association Technic de Fonderie de France.

nace, notwithstanding the fact that the conductors passed through the hearth.

On the other hand, it might be objected that they were not followed in the first furnaces of the Heroult type, in which the better basic action was counteracted by the imperfect closing of the furnace, which was opened by three lateral doors and had the two electrodes passing through it from the roof. Nevertheless the effectiveness of the furnace was not as great as it might have been, although the rectangular surface of the bath was extended, because of the action of the arc being concentrated only in the vicinity of the electrodes. The intensity of the current alone was greatly reduced. The rectangular section, therefore, was unsuitable and at Remscheid it was reduced only to the zone of action of the arcs. The circular form introduced by Nathusius seems to be preferred, and it was this form of section which Heroult adopted for the 15-ton furnace which be built in the United States.

A New Type of Furnace

All these considerations led the inventor previously mentioned to produce a special type of electrical furnace, in which the principles already indicated were further developed and the various defects were minimized.

He sought on the one hand, to secure rapidity of fusion and on the other to insure good purification by making the current pass as directly as possible—but at the same time with uniformity of distribution—through the metallic mass and the slag, the furnace being simple in construction, strong and well closed, without an excessive intensity of current being necessary.

For this purpose he constructed a closed crucible with only one opening for charging the material and the additions and for pouring the finished metal. He also placed the large carbon electrode in a sheath to obviate air currents in the space left free between the electrode and the roof. Thus he facilitated a better basic action.

In fact, as the lateral linings of the furnace presented a larger surface than that of the hearth (bottom) the number of iron conductor bars embedded in the linings can be increased so that their section can be lessened.

Thus a strong magnesite bottom can be composed which resists the action of overheated metal much better than an armoured hearth.

Wires of 6 to 10 millimeters were found sufficient to obtain currents of 1200 to 1500 amperes at 85 volts capable of developing the temperatures necessary for the purification of the entire mass notwithstanding the depth of the bath.

The electric resistance of the conductor electrodes thus constituted is almost negligible, for, as has already been pointed out, the surface of the linings permits bringing into play a considerable number of wires equivalent to such a large conductance section that, without taking account of the conductivity of the bottom the loss is already practically nil.

The use of small section metal conductors, tends to produce a more uniform circulation of the electric current than the use of large section conductors, and the large surface of the positive carbon electrode is well utilized owing to the excessive splitting up of the current at the surface of the bath.

The electric resistance of the conductor electrodes thus constituted is almost negligible, for, as has already been pointed out, the surface of the linings permits bringing into play a considerable number of wires equivalent to such a large conductance section that, without taking account of the conductivity of the bottom the loss is already practically nil.

The use of small section metal conductors, tends to produce a more uniform circulation of the electric current than the use of large section conductors, and the large surface of the positive carbon electrode is well utilized owing to the excessive splitting up of the current at the surface of the bath.

To facilitate the process of refining still further the inventor was led to adopt a special device which consists in introducting two rows of superimposed lateral electrodes, the lower ones being termed fusion electrodes and the upper ones refining electrodes.

The fusion electrodes, which vary in number with the capacity of the furnace, are formed by a bundle of pure iron wires imbedded at the base in a mixture of magnesia and tar and united at the top so as to give a good contact with the metal contained in the crosswise channels arranged in the furnace hearth.

These electrodes are joined in series by a copper bar, which is itself connected by cables to the negative pole of the current transformer. The refining electrodes, which are placed on a level above that of the others, facing the slag, are also variable in number according to the capacity of the furnace.

A special device enables the current to be taken from the fusion electrodes and afterward from the refining electrodes, or alternatively from both rows of electrodes at once.

The number of wires forming the electrodes, as also the section of these wires, varies with the capacity of the furnace. The wires of the fusion electrodes have always a larger section than those of the refining electrodes.

In every case the current enters by a large vertical carbon electrode passing through the furnace roof, its horizontal section being half that of the furnace crucible.

When direct current is employed this large positive electrode is hollowed out and forms a heat reflector; moreover the oxygen of the bath is liberated and is carried to the positive pole instead of remaining in the bath and oxidizing it.

The furnace proper consists of a steel plate body with a nonconducting refractory lining and fitted with a cover. Hollow trunnions, through which the conductor cables pass, enable the whole apparatus to be tilted.

In this furnace the current always passes through a layer of relatively thin metal, which enables currents of much low intensity to be used. An intensity of 1500 amperes is not exceeded; nevertheless the temperatures obtained are diffused throughout the entire mass of the slag and metal.

As was mentioned at the beginning of this paper this furnace was employed during the war in the production of high-speed steel. It was installed at the Jarville works of the Eclairage Electrique Co. near Nancy, now amalgamated with the Thomson-Houston Co. The results obtained appear to indicate that, with continuous working and by treating 1000 kilograms per heat with an amperage of 3000 at 80 volts it would be possible with one furnace to obtain an output of eight tons per day by deoxidizing the metal obtained from a converter.

New Coast Factory Builds Steel Containers

In order to meet the demand for its products on the Pacific coast, the Republic Steel Package Co., Cleveland, has recently completed a plant at Richmond, Cal., for manufacturing barrels and other steel shipping containers. The new unit will have a capacity of about 1000 oil barrels a day which will be made in sizes ranging from 5 to 110 gallons. Packages also will be built in various styles to satisfy shipping requirements of different materials. To meet recent demand the company is producing a steel package with larger openings than are required for liquid shipment. This container has an opening 9 x 12 x 15 inches and is closed with either friction or a bolted cover which can be fastened by tightening four small bolts. Equipment is to be installed for the manufacture of steel packages of lighter construction than the ordinary barrel. These will be suitable for solid or semisolid materials.

Underground storage tanks of all sizes are to be produced by the company. Special tanks can be made from specifications. New styles of tanks are being designed.

RebuildsPlantWithoutShutdown

Crucible Steel Shops of Krupp Works Continues in Operation While Workmen Replace Wooden Building with New Steel Structure—Cranes Used for Handling Material—Erecting Cost Is Low

BY M. SCHLEUSSNER

METHODS of manufacture change so rapidly that in many industries the buildings found suitable a generation ago now are obsolete. Increased crane loads, heavier machinery and the need of more adequate facilities for lighting and ventilation make the old structures unfit for further use.

Faced with this situation, the manufacturer frequently erects a new plant on another site and moves his equipment into it from the old plant. Sometimes, however, it is necessary to rebuild on the original site, and in almost every case this means razing the old buildings to make room for the new. Obviously this interrupts production.

This problem recently was solved by the management of the crucible steel shop of the Krupp's Cast Steel Works at Essen, Germany.

The old wooden structure, indicated by the dotted lines in Fig. 1 was replaced by the modern steel framed building shown by the solid lines. The replacement was accomplished gradually and melting operations in the foundry were not interrupted.

The work of reconstruction was decided upon in February, 1913, and even before the war it had been possible to advance it considerably. As the subsoil conditions caused certain difficulties in the work of laying the foundations and necessitated repeated interruptions the completion, in several sections, was not effected until the summer of 1915.

Although their dimensions and load capacity exceed what is usual the new buildings in themselves present no exceptional feature. The method of their erection, on the other hand, merits notice because it was requisite that the melting work should not be curtailed or even interrupted and for this reason the floor of the building had to be kept free of material, working utensils and fitting apparatus and all transportation in the interior of the building had to be eliminated. These conditions necessitated a method of erection which, so far as is known, had not previously been employed in superstructure work and which therefore may be described briefly.

The method employed consisted in utilizing the structure of the building itself as a foundation for the requisite transportation and lifting appliances. It thus resembles in some respects the "free projection" method frequently used in bridge construction. Conditions in the present instance were specially favorable for its utilization, as high sectional measurements had to be used for the central casting shop owing to the heavy craneloads. The structure therefore was able to carry without difficulty the loads of the auxiliary apparatus, which were considerable. Two traveling cranes of 210 tons and two of 50

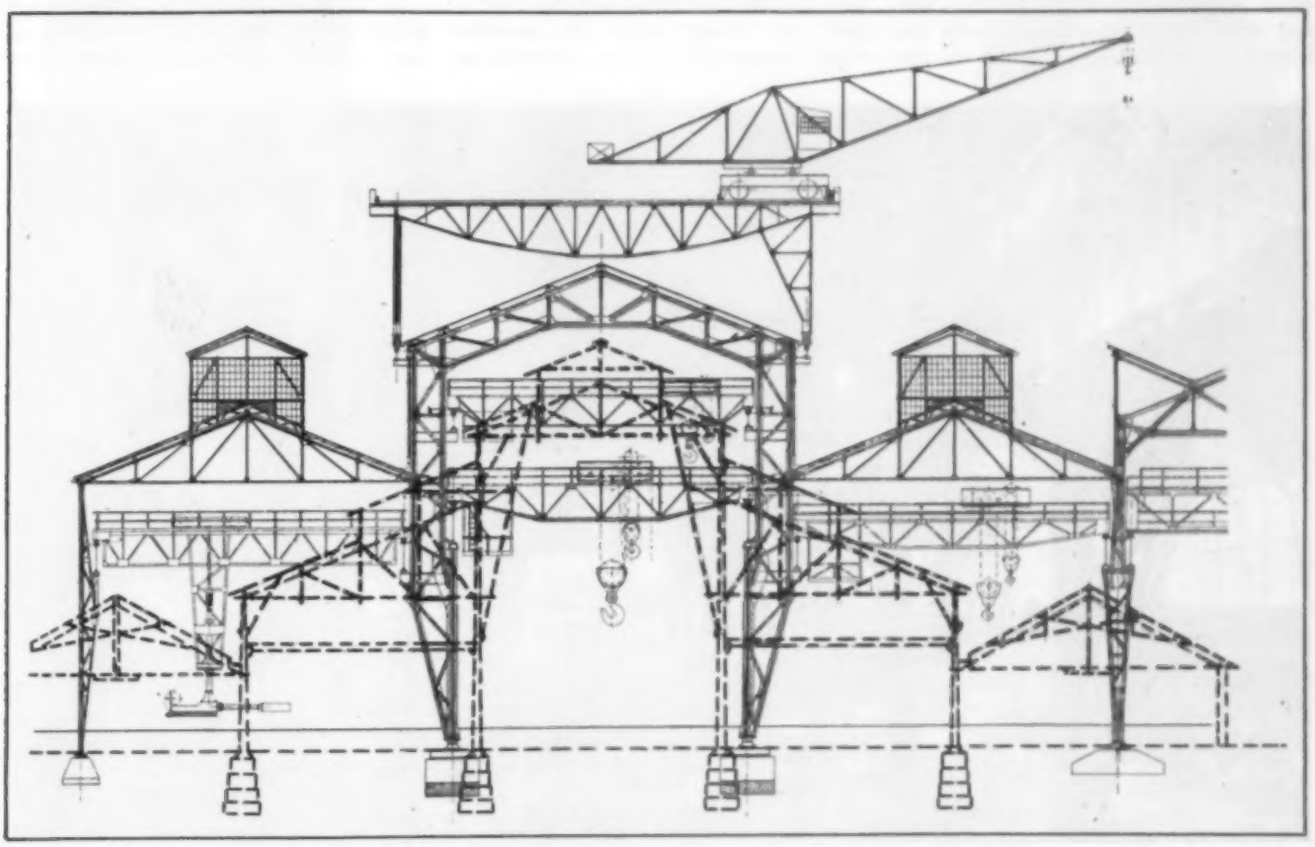


FIG. 1—DIAGRAM SHOWING THE OLD WOODEN STRUCTURE REPRESENTED BY THE DOTTED LINES AND THE STEEL BUILDING WHICH REPLACED IT INDICATED BY THE SOLID LINES

FIG. 2—STEEL FOUNDRY BEFORE IT WAS REBUILT SHOWING THE WOODEN CONSTRUCTION

tons each were included in the equipment.

The auxiliary plant consisted of a bridge crane traveling longitudinally with the building and a 6-ton slewing crane with 20-meter radius which could be operated on the bridge crane and thus travel transversely with the length of the building. Owing to this dual mobility, longitudinally and transversely with the axis of the building, the slewing crane was able to carry structural parts, etc. weighing up to 61 tons to every point of the building, which was 48.7 meters wide and 147 meters long, and to play a part in fixing them in position. After removing certain outbuildings which were not required, the structure was started by erecting the north end-bay of the main shop, 12 meters in length, by the customary appliances, and after this had been strengthened the requisite crane plant was put up. The further stages of construction were carried out so as to enable all the parts of the central and lateral

FIG. 3—AFTER REBUILDING WITHOUT INTERRUPTION OF OPERATION

shops after having been brought from the outside to the north gable and taken up by the slewing crane, to be carried to the point where they were to be used and placed in position. The demolition of the old building, moreover, followed the erection of the new structure step by step, so that as soon as a bay 15 meters in length was finished the corresponding section of the old building was removed. The construction of one of these 15-meter bays and the demolition of the corresponding section of the old structure occupied roughly four weeks.

Certain portions of the work were difficult but all of it was carried out without delay. The technical success attained by the method adopted therefore is unquestionable. From an economic standpoint also the result was favorable. The fact that it was possible to draw upon old material for the bridge crane and slewing crane and that these required only a few alterations and that the entire auxiliary plant, including the runways, was employed again elsewhere when the building was completed, were favorable factors in this result. The cost of erecting the melting building—39.70 marks per ton—was increased by the auxiliary plant by only 8.70 marks per ton and therefore amounted in all to 48.40 marks per ton, a result which must be regarded as satisfactory in view of the difficult conditions and the extensive riveting. The plans were prepared by the technical bureau at Essen and the work was executed by the iron construction shop of the cast steel works.

Presents Facts Regarding Use of Cement

In a bulletin recently issued by the Portland Cement association, 111 West Washington street, Chicago, interesting information regarding cement is given. Portland cement is described as a powder so fine that at least 78 per cent of it will pass through a sieve containing 40,000 meshes to the square inch. It is composed principally of lime, silica and alumina obtained from cement rock and limestone or marl and shale or clay; or blast furnace slag and limestone. These raw materials are properly proportioned, finely ground and thoroughly mixed before burning. The material is burned at a temperature of from 2500 to 3000 degrees Fahr., after which the resulting clinker is finely ground into a powder which is known as Portland cement.

It is claimed that several hundred different uses for cement are known. The material was named after a hard rock found on the Isle of Portland, off the coast of England. Portland cement was developed for modern use about 1824. In 1890 about 335,000 barrels were produced and in 1900 the production had been increased to 8,482,020 barrels. The present annual production is estimated at 1,000,000 barrels. One hundred fifteen plants are engaged in making cement, their capacity being 140,000,000 barrels.

Franklin Institute Awards Medals to Inventors

Development of Detachable Tooth Saw and Automatic Die Cutting Machine Brings Honors

Special Citations Are Given in Explanation

RECOGNITION of two inventors for developing efficient and economical mechanical devices has been granted by the Franklin institute, Philadelphia, in the form of awards of the Edward Longstreth medal of merit for invention. These men are Samuel T. Freas of Henry Disston & Sons, Inc., Philadelphia, and J. F. Keller of the Keller Mechanical Engraving Co., Brooklyn, N. Y.

Mr. Freas was honored for inventing a detachable tooth saw for cutting metal. Two types have been designed, one for cutting steel rails, gates and risers for steel castings and irregular shapes, the other saw is intended for cutting heavier objects, as large steel forgings. The announcement of the institute states that "the results of this investigation indicate that the inventor was the first to fully realize the stresses developed in a metal cutting saw and to use this knowledge in inventing an inserted tooth metal saw which operates effectively in the many uses to which it is applied and has become a commercial success."

The distinction was accorded Mr. Keller for his invention of an automatic die cutting machine of the reproducing type. Its principal features are claimed to result in a saving of time and labor. In honoring the inventor the institute states that "the institute believes credit should be given the inventor for having met a recognized need for increasing die production and reproduction over that which was possible by the old hand method and skilled operators. His efforts have resulted in easier, quicker and better production by less skillful operators and a reduction of the costs."

Steel Trade Outlook Promising

Present Demand Great and Diversified and Beyond Ability of Mills To Supply while Coal Strike Interferes—Conservative Interests Trying To Prevent "Runaway" Market—Little Prospect of Reductions in Near Future

BY GEORGE H. MANLOVE

THE ideal market would have no uncertainties. There would be no probability of wages advancing or declining, no probability of freight rates being changed, no coal strike, no car shortage or fuel shortage and no possibility of a buyers' strike. The ideal market would have a price schedule subject to few fluctuations and those slight, it would present an even balance of production and demand and a distribution of buying the year round that would prevent mills piling orders at one time beyond their ability to ship, and running half time at another period of the same year.

The only market of this kind the steel trade ever has seen was that for standard steel rails as it existed before the world war. For decades rails were a stable commodity at a set price which never varied. Railroads were the only buyers and sometimes they paid more than the market on other forms of steel and sometimes less. The demand was fairly steady from year to year and deliveries could be arranged to keep mills working steadily, with no peaks of demand and few periods of slack orders.

Rail mills could afford to make a standard price under these conditions, and they could as well afford to sell bars and structurals and other steel on a fairly stable price basis if consumptive capacity was equally large and steady. Steady operation of mills without peaks would do much to keep prices from soaring at one time and dropping out of sight at another.

But what happens? The past few months have been an illustration. Mills had little business. Many buyers believed prices would go lower. Orders for a week's requirements were placed on Monday and shipment was made on Friday. One Monday however, word came back that shipment could not be made for three weeks. The buyer had no stock to cover the interval. Other buyers sensed the situation at the same time and all rushed into the market to cover for a month ahead. Over night the market turned from a buyer's to a seller's and deliveries in a twinkling were advanced to a month, two months and further.

That is where we are today. The days of immediate shipment have gone as far as the present movement is concerned. Mill books are congested and are growing more so each week, mills are turning away business. An important steel producer during a recent month booked at Chicago 10 times the tonnage sold in the corresponding month in 1921 and refused 100,000 tons of actual business. At present bookings are twice the shipments. The report of unfilled tonnage by the United States Steel Corp. shows this.

The recovery of the steel industry in the past few months has been rapid, in line with the usual course of its upward turns. In July 1921 pig iron production was 864,642 tons, the lowest since December 1903. Ingot production the same month was 803,376 tons. In May of this year pig iron production was 2,309,348 tons, an increase of 167 per cent over last July, nearly threefold. The steel ingot production reached 2,711,141 tons for May, also practically three times that of last July. THE IRON TRADE REVIEW tabulates the prices of 14 iron and steel products to obtain a composite average of selling prices to show the trend of the market. This composite for the week just closed was $36.74. For the previous week it was $36.72. The lowest point was reached in February when $32.80 was average, since which there has been a gradual rise.

Buying In Large Volume

Railroad cars are being bought in large volume and as an average of 10 tons of steel is used in each car, this makes a heavy demand on steel mills. In the first five months of 1922 87,225 cars were purchased, more than three times the number bought in 12 months in 1921. Present buying is at the rate of more than 200,000 cars per year, which is about sufficient to equal cars put out of service in the usual course of business. Railroads have much to buy to keep up with the increased demands from a growing business development and may be expected to buy heavily for some time.

Demand for structural tonnages to carry the great building movement has increased nearly fourfold in the past 12 months. Comparative statistics show that in March 1921 fabricating shops booked 52,300 tons, which would engage 29 per cent of their capacity. In April 1922 they booked 177,600 tons, equal to 99 per cent of their capacity.

Demand for steel is greater than the ability of mills to make it. The Illinois Steel Co. is operating its plants at 86 per cent of capacity. Fuel conditions prevent this being increased. This 86 per cent of present capacity, however, represents more steel than 100 per cent capacity before the war.

As to prices, there are some underlying principles which are fairly certain to work out in a definite way. When mill orders much exceed productive ability prices certainly will not decline. They at least will remain stationary. Continuation of strong buying tends to higher prices and peaks of buying usually coincide with peaks of prices. Costs have declined little and some producers are not yet out of red ink, in spite of the generally higher level of prices. Increase in quotations inevitably will continue until a point of at least a small profit for the whole industry has been reached. This profit will come in either of two ways. Costs must come down or selling prices go up. General reduction of freight rates will give great relief as present carrying charges are a heavy burden. The recent announcement of a 10 per cent reduction shows how little aid may come from this source. Lower raw material costs rest largely on the questions of freight rates, taxes and labor costs. If you believe railroad rates will be materially lessened you may honestly predict that steel prices will yield somewhat in proportion. If you are pessimistic as to the future level of freights, you may dismiss the idea of steel reduction from that source.

Wages have been reduced materially from the high levels of the war, but at present a shortage of labor exists in many places. One steel company near Chicago needs 1000 more men Wages are not declining now; they have shown a tendency to advance. It is rumored that a substantial increase will be made soon. That does not indicate a lowering of costs, and it would seem the part of wisdom to epect little or no relief in costs to the

---

Abstract of an address before the annual meeting of the implement makers' department of the National Association of Farm Equipment Manufacturers, Chicago, June 14. The author is associate editor of THE IRON TRADE REVIEW, at Chicago.

steelmaker from changes in this factor.

One influence of benefit to the buyer of finished steel is the fact that steelmakers are holding prices down. They do not want a runaway market. A better relation of cost and selling price is desired, to give some profit, but a rapid increase inprice is not desired. Powerful influences have been at work to hold back the upward tendency.

This influence will cease to be effective when the conservative sellers no longer can sell or give deliveries. Then prices may soar as others able to meet delivery requirements ask premiums for delivery. This time has practically arrived and buyers seeking to book tonnage are asked premium prices.

At present the strongest producers in the steel trade are on the side of conservatism and the market is being held steady. Otherwise consumers would be asked many dollars more per ton for material.

Competiton of foreign material has some effect in restraining prices though the total tonnage available from such sources is not sufficient to control the situation. High freight rates prevent manufacturers situated far from tidewater from obtaining the benefits.

Congestion is growing as the mills are restrained from increasing production freely, due to the uncertainties of fuel supplies, and at the same time continue to receive a large volume of new tonnage. Receipts of new tonnage by leading mills in May were much in excess of its shipments. The flow of business is widely diversified and that promises continuing strength.,

The coal situation which is improving so slowly will become an increasingly important factor during the coming weeks. Some eastern blast furnaces which to resume have put this off indefinitely. Certain eastern works which planned to increase their steel operations are restrained from doing so because of a lack of coal. Such instances probably will multiply if the strike continues many more weeks.

Connellsville Is Key

The key to the steel situation is in the Connellsville coke region. The United States Steel Corp. is getting enough coal from various sources to run its by-product coke plants to capacity. The Clairton plant, the largest works, has a larger stock of coal on hand today than at the start of the strike. However, the Steel corporation and the steel industry at large cannot depend on the by-product coke capacity to keep it going. Therefore it is necessary to depend in a large measure on the Connellsville beehive operations and unless the production measurably expands in the near future the iron and steel industry will have difficulty in maintaining its present rate of production, not to speak of increasing its operations.

One of the things which indicates a healthy situation is the diversity of demand. Present conditions are in sharp contrast to the 1920 feverish upturn of the market which largely was attributable to the automobile situation. Today we not only have a broad automobile production but also a large portion of the current demand is from railroad, building and construction activities. The prime requisite of good business is liberal credit. Loan rates today are low and highly favorable to new enterprise.

Describes Discovery of Manganese Steel

Research narrative No. 35, issued June 15 by the Engineering Foundation, 29 West Thirty-ninth street, New York, deals with the discovery of manganese steel by Sir Robert Hadfield. The details of the early work of this inventor are presented in narrative form by Henry D. Hibbard, consulting engineer, as follows:

"Hadfield's discovery of manganese steel as a result of research practically started the study of alloy steel. Before him, Mushet had, indeed, worked out empirically a self-hardening steel for metal cutting tools, but it gave no such impetus to research in the field of useful metals. As a young man Hadfield started experimenting in his father's steel foundry to see if he could find a hard steel suitable for tram-car wheels. He melted his mixtures in crucibles and tested his products by the means then at hand,—the file, chisel, forge, magnet, and hardening and tempering. These were enough to enable him when he first made an alloy coming within the definition of manganese steel to realize that he was dealing with a new metal.

"Before this time, everyone who had tried the effect of increasing manganese in steel had found that the steel was made harder and less ductile with each increase, so that if 2.5 per cent were present the product was too hard and brittle to be of any use. The highest proportion ever added had been 3.5 per cent, which made the steel even more brittle. Naturally it was believed that more manganese would merely result in still greater weakness.

"Hadfield, however, took nothing for granted but tried everything and as a result found the new alloy which, when it contained about 13 per cent of manganese, and was properly heat-treated, had maximum combined properties of strength and toughness. He told his father, Robert Hadfield, and his superintendent, Mr. Mallaband, about his discovery. They were naturally skeptical and told him that he would better repeat his experiments. He did so with the same result and then they began to take notice.

"Here was a high-carbon steel which in several ways was the opposite of what would be expected by any one familiar with iron. A magnet would not attract it, and when heated to a bright orange heat and cooled quickly, as by immersion in cold water, it was given extraordinary ductility. There were other less notable features but these were enough to excite astonishment.

"Naturally, the first attempts to adapt the new hard metal were for cutting purposes, particularly for metals, but experiments in that direction came to naught. The great field for this steel, resistance to abrasion, particularly by earthly materials such as rocks and ores, was not fairly recognized until 10 years after the steel was first made.

"The discovery, as the result of systematic research, of a metal having such unique properties as manganese steel, started other steel-makers to see whether additional useful alloys could be found. As a result of these activities, which eventually extended throughout the civilized world, many alloy steels have been developed of exceeding importance, which have advanced materially the useful arts and particularly the conquest of distance on land, in the air and under the sea.

"This discovery also argues strongly for research even without a definite object. Hadfield was searching for a hard steel for another purpose. He had no idea of finding a non-magnetic or water-toughening steel. Therefore anyone has a chance of finding something new and useful in any systematic investigation or research which explores any unknown field of knowledge."

Studies Steel Etchings

Sequence etchings have been tried out on a specimen of high speed steel which was in the "as received from the mill" condition by the United States bureau of standards. Sequence etching means the etching with two or three reagents in successive order without any repolishing of the section between the etchings, and the taking of micrographs after each etching at the same spot in the microsection in order to note any changes in microstructure produced by the last etching as compared with that developed by the preceding etching reagent. The reagents used in various combinations were dilute sodium hydroxide solution together with a weak electric current, the specimen being made positive pole; two per cent alcoholic solution of nitric acid: boiling sodium picrate, and Murakami's reagent, solution of potassium ferri-cyanide and sodium hydroxide, at boiling temperature. The results, as judged from the behavior toward the various etching reagents tried, appear to show that there are at least three different constituents present among the imbedded globules or particles in the specimen of high-speed steel, in the "as received from the mill condition," though any attempt to state the nature of these constituents would, in view of present developments, involve speculation.

Practical Training for Foremen

A Simplified Course in the Study of Industrial Engineering To Enable Group Leaders To Interpret and Apply Rules of Sound Business Practice—Their Functions, and Relationship to Capital and Labor

BY P. L. BURKHARD

Chapter VIII—Control

KEEPING your finger upon the pulse of production, watching every job through the shop, knowing the shop, knowing where it is this minute, where it will be next minute and guiding every movement from the stock room to inspection, is control. Control is the fifth principle with which we must deal as industrial engineers on our own jobs. It means beginning ending work on schedule time. It is not enough to plan, we must have control. Planning doesn't get work done; it merely lays out the methods of procedure. It is strictly up to control to see that action and energy are directed intelligently to carry out the plans. Control is the force which produces results.

The same elements for which we plan we also must control. These elements are men, materials, machines and methods, but in subdividing the functions of control we translate these elements into terms of departmental functions.

The department which exercises the control acts as a scientific check to the works manager or general superintendent and should be able to supply any information which may be desired. This department is composed of a group of experts whose individual functions are specialized. There are men in every organization with the brains and abilities to assume the duties of production control and should no such department now exist it may be built from the ground up with the human material available.

Logically production control begins in the purchasing department. It ends on the shipping platform. From there on the traffic department and office assume control. The purchasing department may be or may not be a branch of production control, but unless the two functions, that of purchasing and that of getting out production, are not closely related, confusion is sure to occur frequently.

Centralized Purchasing Desirable

The manufacturing of any product begins with the purchase of the materials. Purchasing is not a part of manufacture, but for that matter neither is control, it being a separate division. If the purchasing of materials is closely associated to centralized control it is safe to say that when materials are needed for the manufacturing processes they will be on hand in the desired quantity.

The production control department obviously has charge of the stores and can let the purchasing agent know what is needed and when, and also regulate minimum and maximum quantities on hand. The function of the purchasing agent is to get the materials as requisitioned by the control department at a reasonable cost and within a reasonable time. The purchasing agent should always know the sources from which materials can be secured, at what price and delivery dates.

Should the shop be a job shop, and in many cases in a production shop the same situation exists, the specifications for materials may originate in the engineering department. It is then up to the purchasing agent to buy on the precise specifications as requisitioned. It is not the business of the purchasing agent to say how much should be bought. That should be left to the control department through its stores system, or to the discretion of the works manager.

Materials will be on hand when needed only when ordered in sufficient time to insure delivery on or before the date when the manufacturing order goes into the shop. The stores system regulates this matter. Should forecast of market conditions and available storing space make it advisable to invest for future needs the decision should then be referred to the management. The purchasing agent or control department should not assume such responsibilities. When requisitions are made upon the purchasing agency for materials they should specify when materials are required and it remains the duty of the agent to dispatch the order.

When transportation companies fail to move freight or express there is but one thing to do, and that is to go after it. This adds to the present day responsibilities of the purchasing agent, and it should be known that his job is by no means child's play.

When proper restraint is laid upon the purchasing department through an efficient system of requisitioning and storing, materials cannot be purchased unwisely. The safe rule for the agent to abide by is to purchase nothing except that which has been requisitioned by the control department.

The purchasing agent in executing an order should send the original order to the source from which material comes, a copy should be filed, a copy should be sent to the bookkeeping department, and a fourth copy should be sent to the control department which requisitioned the material.

Accurate Check Necessary

When the material arrives in the receiving room a check should be made of quantity and quality from actual count and investigation. This should be sent to the purchasing department when it may be compared with the original order. If any discrepancies are noted the purchasing department may begin action at once. If the quantity and quality is as ordered the material passes to the control department and is entered into the stores. Materials cost money and an accurate account should be kept of every ounce or unit of material which enters the stores room.

The practice of putting anything and everything into stores and permitting anyone and everyone to enter at random, take what they apparently need and go out is unwise. It teaches men to be careless and negligent, and possibly dishonest.

The stores room is the vault in which real money is stored and the same care should be exercised in its keeping as we note in the banks where we keep our money. Banks issue money only on requisition. Likewise the stores room should issue materials only when signed for.

Authority of a foreman is not sufficient reason for a stores department to issue materials. If this authorization is in writing it may do for some plants. However, under a system of effective productivity the control department requisitions the stores room for materials, and the stores room delivers that material to the destination specified on the requisition.

When such requisitions are made they should receive immediate attention. They should be delivered as specified. In case they are held up the control department is on the job to know why. A good stores system requires an accounting,

as it prevents many losses of materials, over-issues, misunderstandings and waste time in getting materials. The only effective system of accounting for materials is a perpetual inventory. Periodic shutdowns for inventory waste money. As a subterfuge for dull seasons it is ridiculous and indicates bad management.

Effective productivity does not require shutdowns for inventory. An application of the principles as outlined in this series of articles will overcome such tendencies.

A perpetual inventory is any system which always shows just what quantity and quality has been purchased over a period of time, the amount going into production and the balance on hand.

A card index is the preferable system under most circumstances. There should be a card for each item carried in stock, ruled for a record of materials on hand and materials ordered. At the head of this card should be the name and description of the material, its symbol, its location in the storage room, the low waterline at which a requisition for replenishment should issue automatically and at high waterline indicating the amount which should not be exceeded.

The first column should be used for orders, giving the date and number of each order and the quantity ordered. As each order is received the quantity should be subtracted from the first column and entered in the "on hand" column. As stock is issued it should be subtracted from the "on hand" column, which procedure will continue until the low watermark is again reached at which time new orders are automatically placed.

The production control department may also schedule the quantity required for various jobs. The card should then carry the information as to what quantity of stock is required in a 60-point hour operation.

The card index for perpetual inventory also should be supplemented with a graphic chart showing the quantity of stock on hand, scaled on some common basis, with a danger line showing when reorders should be made. This may be done on a bar chart or thermometer chart, with colored pins, strings or ribbons to mark the quantity on hand.

A board listing every item of material carried is not difficult to maintain, but is very simple and always gives a picture which may be understood by anyone. Such a board eliminates much trouble and renders possible a graphic reading of the accounting system. The inventory work is a duty of the storekeeper or someone designated by the production control department. It doesn't make so much difference as to who keeps it as long as it is always available.

Methods of storing materials vary greatly. Some factories have no stores system at all. Others have storage rooms which improve on the layout of the 5 and 10 cent stores. When materials have been received they should be stored in predetermined and permanent locations, built to measure, with plenty of space for handling and with adequate light to work by.

The location of materials should be entered upon the inventory card and therefore should be permanent, classified either by symbol or by some other determining factor. Standard racks and compartments should be adopted. Effective storing permits dispatching when requisitions are made upon the store room.

Trucks are used in every factory for but one purpose, to move materials more quickly and more easily than can be done by hand. Yet in most cases the unstandardized array of trucking facilities does not permit effective transportation. Hauling is a function of control, but if control is to be effective trucking appliances should be standardized. Trucks should not be commandeered by any worker or foreman simply because he has a load to remove. The control department should know when materials should be moved and to where it should be transported.

Transportation Company Useful

With this knowledge it is a simple matter to issue an order on the transportation department to call at a certain point, at a certain time for a load and deliver it to another point at a specified time. The movement of materials within the plant should be supervised by the control department through the agencies of clerks or stock chasers, but the responsibilities for hauling should rest upon a transportation company within the factory, a part of the control system.

There are many rules by which the tool room may perform its tasks but the safest one is to place it under the control department and require it to follow orders. The same practice which has existed for years in the stores room has also existed in the tool room. Workers have been permitted to get tools without requisition or check. They have taken them when needed or when not needed, on whim or fancy. They have been expected to do their own grinding and redressing. There has been no means to account for the use or return of tools. It has been hit and miss, with more misses than hits.

Such methods are not effective. The tool room is as important as any part of the shop. The tools themselves are most essential. The best men would be helpless if they didn't have tools to work with. Effective productivity is largely a matter of good tools. The better the tool situation the better the shop, the better the product.

It is a paramount duty of the control department to direct the policy of the tool room. Tools should be issued not on the request of the worker or his foreman but on the statement of the control department. Every job ticket issued from the control to the manufacturing department should specify the tools required on the job. As the order is put into operation tool tickets should go to the tool room advising that a certain machine requires certain tools at certain hours and ordering the delivery by the tool room to the machine of those tools, and ordering pick up at a later hour.

Boys and old men who no longer make good on heavier work should make the deliveries rather than strong, healthy operators. It is unfair to the worker whether he be on a piece rate, bonus or premium system to expect him to waste his time doing a boy's chasing. If he is on day rate he may enjoy the time off, but if he is working for an incentive he doesn't want to lose time and the factory shouldn't want him to.

Since grinding tools is a job of a highly skilled machinist it is not logical to permit an operator at a lower rate to grind his own tools, while his machine is standing idle. If a man is capable of grinding tools there is a possibility that he is too good to be an operator. Grinding tools should be taken care of in the tool room. This is no reflection on the operator at all. It permits him to specialize on his one job and thereby increase his earnings. Also with a larger labor turnover, it is dangerous practice to allow everyone to grind tools, and to discriminate would hardly be justified.

The keeping of tools should be like the keeping of stores, on a scientific basis. A card file should be kept giving information as to location, uses, issuance, life, replacement and so on. The number of duplicate tools to be kept depends upon the shop. In no case should the situation occur that when a tool wears out the job is held up indefinitely because no duplicate may be substituted.

Tools should always be ground and ready for use before going on the shelf. They should not be permitted to pile up when received from a job. Immediate attention should be given every tool when it is brought from the machine.

The despatching of a production order begins with the notification to the production control department by the sales department that certain estimates have been approved by the customer and that the job is demanded by the customer at a certain specified time, or that a certain quantity of standard product is wanted at a certain time. Delivery promises should not be made until the production control department has been consulted and until a tentative plan has been

drawn up taking the materials right through from stores to inspection. This, of course, is not necessary when standard orders may be filled from stock.

When the production order comes into the shop it should carry instructions complete as to what to do and how to do it, plans for delivery of material at time order should begin, machines to be at the disposal of the job, tools and jigs needed and scheme for moving materials as completed and pick-up of tools.

This might seem that the control department is to do all there is to be done, but that is not the case. The work must be done; the manufacturing departments are the only ones which can do it.

The control department has done the routine thinking and will check up, but it is up to the foremen and his workers to get the results. The control department has done all it can to help and assist, but dispatching is up to the factory. The chief dispatcher of every department, is the foreman. He is the man who can make the control effective by putting his shoulder to the wheel and putting the big program over.

First, the foreman should check to see that materials have been delivered as ordered by the control department.

Second, he should check instructions and be ready to elaborate where necessary so the worker can produce his standard points.

Third, he should check tools so that he may be assured that everything will move along as planned.

Fourth, he should keep his eyes on the transportation company so his department is not littered up with materials that should be removed.

Fifth, he should look over the machines and equipment so that he may be assured that his department will produce standard points for every day.

Sixth, he should be on the job to help his men in every way possible.

Seventh, he should report every failure on the part of the branches of control, stores, tools, and transportation, so that the central office may check up every discrepancy at the beginning.

What does all this mean? It means that the department head must be an efficiency man. He should be the industrial engineer in his department, ready at all times to report inefficiencies to the chief engineer, the control office.

Getting production orders through with the minimum waste is the reason why a control department should be created. The foreman is the manufacturing engineer who should acquaint the chief with every item of waste discovered, and furthermore, it is his business to make such discoveries.

If the control is calculated in point hour values, as has been previously explained, 60 points per hour is standard for worker, machine and material. The standard point hour times the number of operators in a department and gives the departmental point hour value; that is 60 × No. of workers = department standard.

With a standard of 60 points per hour on all jobs and operations, and with hourly reports to the control department, it requires but a minute's notice of a control clerk to check up and see what departments or machines in departments are not producing standard. If standard is not being produced it is only a matter of minutes before the control has put its thumb on the trouble. A utility gang, a flying squadron or an extra force, may be called upon to go to the aid of the lagging department and bring output up to standard.

If the trouble happens to be in the equipment, immediate attention to equipment will overcome the difficulties at that point.

Failure of a manufacturing department to furnish material at a given time according to schedule will cause the production control department to pay particular attention to this item. The work may then be completed during the time of grace and furnished to the department next in sequence at the proper beginning time. This is dispatching and is illustrative of the functioning of control.

Rate setting also is a function of production control, closely allied with planning and the accumulation of data, as one of the best means for the exercising of control is the developing of incentives. Discussion of rate setting, however, will follow in the next chapter.

Defines Inspection

Inspection should be separate from manufacture. For this reason it may reasonably become a function of the centralized production control department. In this way manufacturing departments can be prevented from slighting their work in a desire to make greater earnings, particularly true under piece rate, but also evident under the usual bonus and premium plans.

You may be operating under a system in which you are your own inspector for your own job. If so, you may be very conscientious, but you are also human. It is human to pass your own work as O. K. In some instances workers inspect their own work, and quality usually suffers.

If inspection is to be effective it must be done by specialists. The ideal of the inspection staff should be quality first, last and always. Inspection may or may not be done at the machine. It is usually desirable that the inspector of a product shall be removed from the influence of the men who produced it.

The purpose of inspection is not to throw out rejects but to prevent the production of rejects. With an adequate inspection system workers are more careful.

Materials which have been rejected are usually termed "scrap" although as a rule the rejected materials are far from being actual scrap, since they may be salvaged or diverted to other uses. In general rejected materials may be disposed of in the following manner:

1. To be passed as defect does not affect completed product.
2. To be repaired or reworked as defect is of such a character that it may be repaired or material reworked for other purposes.
3. To be returned to vendor as defect is traceable to raw materials before receipt.
4. To be returned to stores for future use as defect does not affect value of material itself.
5. To be scraped as material is beyond reclamation and therefore, has no intrinsic value other than as scrap.

The function of inspecting should include the classification of rejected material and the report be made to the production control department so that order for disposition may be made. A finished stock room should be maintained under a system equally as scientific as that of raw materials.

Finished stock is raw materials plus labor cost, plus machine expense, plus supervision and overhead. The finished product represents much more money than the raw material.

For this reason, and also because the finished product should always be ready for immediate shipment, too much care cannot be exercised in the storing and accounting of the finished product. When the product has passed final inspection it goes either to the shipping room for dispatch or it goes into stock. In either case the control department enters the completion of the order upon the books.

Inventory should always be available in the stock room. The finished stock should be accounted for in very much the same manner as the raw materials with a card for each item to which additions or subtractions may be made. A graphic picture can be drawn in much the same way. The quantity of stock should be entered on the left column from bottom to top, the items should be entered at the base, the length of the board being determined by the number of items usually maintained in stock.

The Delco Light Co. of Dayton, Ohio, a division of the General Motor Corp., has organized the Delco-Light Co. of Canada Ltd., and has established a plant at Oshawa, Ont., under the management of R. L. Meyers.

German Competition Is Overrated

Machinery Exports of Four Leading Countries Show German Total Has Steadily Declined—Industrial and Financial Conditions in Central Power Impair Its Position as a Competitor in the World Machinery Markets

BY WILLIAM ALTHOFF

THE present position of Germany as a competitor in the world's machinery markets has been considerably overrated. Machinery exports of Germany, the United Kingdom, the United States, and France for the four years preceding the war, as well as during the four years beginning with 1918 are shown in the accompanying chart. Table No. II shows the percentage furnished by each of these countries in relation to the total of the four combined, and in table No. I the machinery exports of other important countries during 1920 and 1921 are indicated. This latter table affords a basis of comparison with the returns in table No. II.

The figures are based on the custom house returns and comprise such equipment as is included in the respective machine classifications. It should be remembered that differences exist between the classifications adopted by the various countries and the figures are presented more with the idea of illustrating the general trend of trade than of indicating the precise amounts claimed by each country.

The author is assistant chief of the industrial machinery division of the United States department of commerce, bureau of foreign and domestic commerce.

The rates of exchange employed to convert the foreign currencies to American dollars are the daily average for the year, as furnished by the federal reserve board.

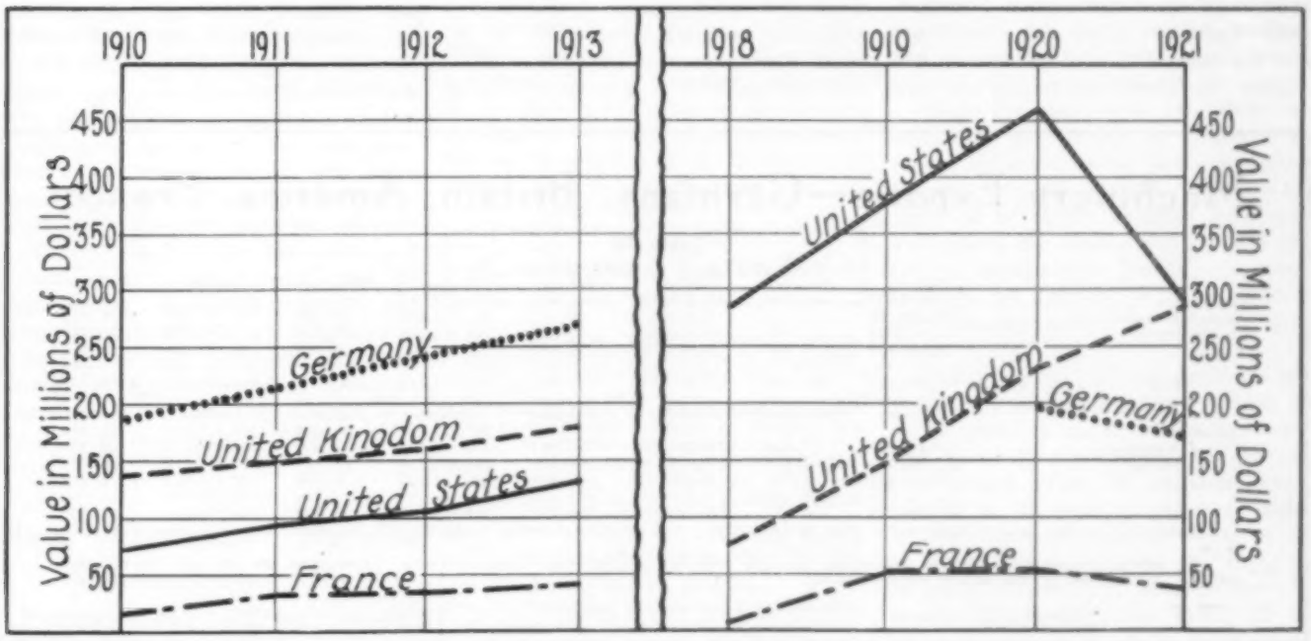
Leads in Prewar Years

As can be seen from table No. II, during the years 1910 to 1913 inclusive, Germany, the United Kingdom, the United States and France exported annually a total average of $530,000,000 of machinery. Throughout this period Germany held first place, but its proportion fell from 45.1 per cent of the total of these countries in 1910 to 43.6 per cent in 1913. The proportion of the United Kingdom also declined continually during these years, and in 1913 its share was only 28.8 per cent as against 33.1 per cent in 1910. The United States, on the contrary, secured a larger proportion each successive year, rising steadily from 17.1 per cent of the total in 1910 to 20.8 per cent in 1913. In value this represented an increase of almost $57,000,000. In 1918 and 1919 the United States furnished the bulk of the machinery exports the actual amounts being $282,000,000 and $378,000,000 respectively.

During 1920 Germany was again in the field, the total of the four countries ascending well on toward $1,000,000,000. Of this the United States supplied nearly one-half or 48.9 per cent, the United Kingdom 24.6 per cent, and Germany 20.8 per cent. The United Kingdom alone of the four countries showed an increase in the value of its exports in 1921, due largely to heavy shipments of textile machinery on orders that had long been unfilled. Machinery exports from the United States fell off considerably during 1921, this being due in a large measure to the reduction in unit prices and to the extraordinary exchange situation that prevailed in the world markets. It should be noted, however, that American machinery exports in 1921 exceeded in value those for 1918 and were more than twice as great as in 1913.

During 1921 America exported machinery to the extent of $290,000,000 or 36.2 per cent of the total of the four countries combined as against $130,000,000 or 20.8 per cent of the 1913 total.

The outstanding feature of the figures is that in 1920 and 1921, Germany, in spite of the advantages of favorable exchange rates, low wages, government subsidies, etc., exported only about



MACHINERY EXPORTS OF GERMANY, UNITED KINGDOM, UNITED STATES AND FRANCE, 1910-1913 AND 1918-1921. FIGURES OF THE WAR PERIOD, 1913-1918, HAVE BEEN OMITTED

Annual Machinery Exports of Leading Countries

Table I

Country	1920 Value in Foreign Currency	1920 Average Rate of Exchange	1920 Value in United States Currency	1921 Value in Foreign Currency	1921 Average Rate of Exchange	1921 Value in United States Currency
Switzerland—francs.	276,466,000	16.903	$46,731,048	228,850,000	17.3539	$30,714,400
Sweden—kroner ...	156,857,407	20.494	32,146,357	94,055,897	22.5397	21,199,917
Australia—pounds..	5,179,252	3.66427	18,978,178	9,497,604	3.849056	36,556,810
Belgium—francs ..	239,041,298	7.38	17,641,248	249,104,342	7.4461	18,548,558
Italy—lire	322,929,575	4.97	16,049,600	*	.....	.....
Canada—dollar ...	9,504,857	....	9,504,857	4,061,174	.....	4,061,174
Japan—yen	16,710,133	50.368	8,416,560	12,883,101	48.2485	6,215,903
Netherlands—fulden	20,223,677	34.419	6,960,787	*	.....	.....
Denmark—kroner..	39,932,000	15.775	6,299,273	*	.....	.....
Norway—kroner ..	9,726,900	16.53	1,607,857	*	.....	.....
Total.....	.....	....	$164,335,765	.....	.....	.....

*Statistics for 1921, for Netherlands, Italy, Norway and Denmark are not available.

one-half the proportion it shipped during the prewar period.

Fundamental conditions existing in Germany are such as to seriously impair its position as a competitor in the world machinery markets. To a large extent its low costs have been the result of direct and indirect government subsidies which the German government must necessarily abandon. Government control as applied to grain prices has already been abolished, bringing about a general movement for higher wages. Freight rates and raw material prices are rising rapidly and labor difficulties are becoming increasingly numerous. There is a shortage of coal and coke. The forced internal loan contemplated by the German government will undoubtedly be demanded in the near future. The amount is about 1,000,000,000 gold marks, equivalent to approximately 70,000,000,000 paper marks. This loan will be a heavy burden. The supplementary taxation, which must necessarily follow will raise production costs still higher. Furthermore Germany is becoming sold out and the continuation of production will involve increased purchasing of raw materials from outside sources at prices which will be almost beyond the German buyer, although in line with the world markets.

These and other factors make it practically impossible to quote firm prices for long-term commitments. The tendency now is to quote prices subject to increases to cover any enhanced production costs that may occur before the goods are delivered. The cancellation of numerous orders placed in Germany by foreign customers is reported.

All these conditions have a further peculiar significance when it is remembered that during recent years German machinery builders have found it difficult to deliver machinery in accordance with prices and delivery dates contracted.

Discusses Crystallization Resulting from Strain

At a recent meeting of the German Metallographical society J. Czochralski read a paper on counter-crystallization resulting from strain. He defined this expression as recrystallization resulting from a previous mechanical strain of the metals and expressly excepted crystallization arising from molten metal and in phase transformation in solid metals. He regards as erroneous the view that a grain growth appears in metals solidified from a liquid state and cited experiments to show that even with the purest experimental metals, such as gold, it is impossible to observe any detrimental growth of casting crystals.

After giving a historical survey of the subject, Mr. Czochralski described the present position of the counter-crystallization theory, and said that the influance of time now appeared to be the one uncertain factor remaining. The counter-crystallization phases hitherto obtained all apply, he said, to a definite duration of the temperature influence. Oberhoffer's work seems to show that with a particular degree of strain being exceeded, the grain increase curves do not ultimately lie asymptotically but tend towards high grain-size values in accordance with an unknown law. It is possible that with a sufficiently long the same grain sizes might be obtained with one and the same temperature of fusion notwithstanding differences in the degree of strain.

Chromium Steel Tested

Tests which the United States Bureau of standards has carried out upon the corrosion of chromium steel indicate the behavior of the material when subjected to the acid test is not a sure criterion of its resistance to atmospheric corrosion. Of all the alloys examined, a high nickel-chromium steel, invar, pure iron, and medium carbon steel, slowly cooled from a high temperature were the most resistant to hydrochloric acid as measured by the loss of weight per unit area per day. High chromium steels were found to be attacked by acid more readily, when the same specimens were subjected to a weathering test..

Machinery Exports—Germany, Britain, America, France

Table II

	1910 Dollars	1910 Per cent	1911 Dollars	1911 Per cent	1912 Dollars	1912 Per cent	1913 Dollars	1913 Per cent
Germany	193,974,835	45.169	217,407,998	43.529	244,378,193	44.614	273,035,559	43.671
United Kingdom	142,449,170	33.171	150,670,139	30.167	161,363,480	29.459	180,121,988	28.810
United States	73,851,098	17.197	96,504,104	19.322	106,961,269	19.527	130,554,379	20.882
France	19,164,900	4.463	34,875,100	6.982	35,048,800	6.398	41,495,000	6.637
Total.....	429,440,003	100.000	499,457,341	100.000	547,751,742	100.000	625,206,926	100.000

	1918 Dollars	1918 Per cent	1919 Dollars	1919 Per cent	1920 Dollars	1920 Per cent	1921 Dollars	1921 Per cent
Germany	.....	.....	.....	.....	197,337,787	20.885	*179,677,830	22.449
United Kingdom	78,450,233	29.246	158,988,618	26.971	232,433,323	24.600	287,256,954	35.891
United States	282,986,853	67.225	378,425,958	64.198	462,933,704	48.995	290,414,115	36.285
France	10,851,618	2.577	52,050,170	8.830	52,138,732	5.518	43,011,022	5.378
Total.....	372,288,704	100.000	589,464,746	100.000	944,843,546	100.000	800,359,921	100.000

*Estimated on the basis of returns for May to December. Statistics for January to April, 1921, inclusive, have not been published as yet.

The following rates were used in converting the 1920 and 1921 foreign figures into dollars. These rates are the daily average for the year, as supplied by the federal reserve board:

	1920	1921
Germany	1.1751	1.2045
United Kingdom	3.66427	3.849056
France	7.04	7.4554

Foreign Sales

Made by British Empire Steel Corp.—Sydney Mills Started

Toronto, Ont., July 3.—According to an official statement the billet and blooming mills of the British Empire Steel Corp. at Sydney, N. S. went into operation June 26, increasing the force employed to 2000 men. The plant for the first time in its history has successfully entered the foreign market for finished steel products. It is stated that orders are on hand for nails, barbed wire and galvanized wire for Buenos Aires, South Africa, New Zealand, Costa Rica, Colombia, India and the British West Indies. The largest order is from Australia for 700 tons.

At the adjourned meeting of the shareholders of the corporation June 27 in Montreal the first permanent board of directors was elected as follows: C. P. Beaubien, Viscount Furness; Sir Trevor Dawson, Major-General Sir Newton Moore, Lord Invernaim, Hector McInnes, Dr. W. L. McDougall, D. H. McDougall, Frank Ross, W. D. Ross, H. B. Smith, J. F. M. Stewart, Galen L. Stone, Benjamin Talbot, and President R. M. Wolvin.

President Wolvin said the new financing plans of the corporation have not yet been completed. During the fiscal period, April 16, 1921 to Dec. 31, 1921, the total output of coal was 2,964,522 tons as compared with 3,133,007 tons during the corresponding period of the previous year. The Newfoundland mines produced 285,000 tons of iron ore during the last fiscal period as compared with 566,000 tons for the previous corresponding months.

Owing to high ocean freight rates the corporation was unable to dispose of its ore either in Europe or the United States, and consequently large stock piles accumulated at the mines. Ocean freight rates are now lower, and contracts have been entered into with "practically every large steelworks in Germany." In conclusion Mr. Wolvin said: "Our work in the first eight and a half months was largely that of consolidating the operations of the company's properties, thus gradually occuring to the company material saving through unification. This required much time and the benefits will be realized more fully in future operations."

New Compass Detects Nonmagnetic Ore

Washington, July 3.—Though nonmagnetic, the brown iron ores of the Woodstock, Ala., district have a similar and definite action on the needle of the dip compass, the federal bureau of mines reports, and a compass has been devised by the bureau that will locate bodies of this ore. It is planned to extend the investigation to other nonmagnetic ore bodies as rapidly as time will permit. The bureau has determined by laboratory and field tests that there is a constant variation in the dip needle for each degree of change in temperature. The constants have been established for the arrowhead and car types of dip needle. The workings of the dip needle have been checked over tested ground with uniform satisfactory results. An extended study is planned at different occurrences of ore to interpret observations.

Localization of low-grade high silica iron ores, the support of mines and the ventilation of the mines of the Birmingham, Ala., district are being studied in an investigation now in progress.

Societies News

THE annual convention of the New England sections of the American Society of Mechanical Engineers will be held Oct. 9 to 11 at Springfield, Mass. Headquarters are to be established at the Kimball hotel. An attendance of about 1000 is expected.

* * *

Local Chapter Elects

At the annual meeting of the Providence Engineering society held in Rochester, R. I., June 23 officers were elected as follows: President, Prof. John A. Hall, Brown university, Providence, R. I.; vice presidents, Fred C. Freeman, A. W. Eaton, and F. W. Bliss; secretary, J. T. Barnicoat; treasurer, A. R. Thomley; librarian, E. E. Baker; chairman of publication committee, F. R. Inman; councillors, Robert H. Lyons, W. C. Slade, E. E. Nelson and George Squibbs.

Convention Calendar

Aug. 28-30—Lake Superior Mining institute, twenty-second annual meeting at Houghton, Mich. A. J. Yungbluth, Ispheming, Mich., is secretary.

Sept. 5-9—American Chemical society, fall meeting at Pittsburgh. Charles L. Parsons, Box 1505, Washington, is secretary.

Sept. 11-15—Association of Iron and Steel Electrical Engineers, 1922 convention at the new auditorium, Cleveland. John F. Kelly, Empire building, Pittsburgh, is secretary.

Sept. 21-23—American Electrochemical society, fall meeting at the Windsor hotel, Montreal, Canada. Dr. Colin G. Fink, Lehigh university Bethlehem, Pa., is secretary.

Oct. 2-7—American Society for Steel Treating, exposition and convention at the General Motors Co. building, Detroit. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Price Advances

Quoted on Sulphate of Ammonia—Coke By-Products Demand Fair

New York, July 3.—Prices on sulphate of ammonia have again advanced, $2.80 to $2.85, f. o. b. works, being quoted on domestic business, and $3.30 to $3.35 on foreign. Demand is fairly active, with domestitc consumers now figuring on their requirements over the next 12 months. Some inquiry also is coming out from Japan.

The situation in light oil distillates is described by sellers as excellent, demand, just about keeping pace with allotted production. This applies to benzol, toluol, solvent naptha and xylol, although in toluol, the market appears less active than in the other products. A feature is the increase in demand for motor fuel, this being largely seasonal, and during the past week a substantial shipment has been ordered for export.

While the coal strike is influencing sellers in their policy on future shipments, it has not as yet had any marked bearing on the market. The ovens seem to be amply supplied with coal and unless the strikes run on into the fall, a development hardly expected, little or no difficulty is likely. Sellers are booking orders for August shipment.

Quotations on light oil distillates are unchanged as follows: Pure benzol, 30 to 33 cents, f. o. b. works in tanks, and 35 to 38 cents in drums; 90 per cent benzol, 27 to 29 cents in tanks, and 32 to 34 cents in drums; toluol, 30 cents in tanks, and 35 cents to 38 in drums; solvent naptha, 27 cents to 29 cents in tanks, and 33 to 34 cents in drums, and commercial xylol, 29 to 32 cents in tanks, and 34 to 37 cents in drums.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32

Per Pound at Producers' Plants

Phenol	$0.15
Naphthalene, flake	.07 to .08
Naphthalene, balls	.08 to .09

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$2.80 to $2.85

Contract

Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29
Commercial xylol	.29 to .32

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	$0.07 to $0.08
Naphthalene, balls	.08 to .09

Per 100 Pounds at Producers' Plants

Sulphate of ammonia (12 months)	$2.80 to $2.85

Testing Society Work Expands

Reports of Numerous Committees Involving Proposed Changes in Specifications Engages Attention of Members of Society at Atlantic City Convention—Support of Plan for International Standards Is Urged

EXPANSION and growth marked all phases of the activities of the American Society for Testing Materials at its twenty-fifth annual convention held at the Chalfonte-Haddon Hall hotel, Atlantic City, N. J., June 26-30. All records for attendance were broken the registration being 915 as compared with 788 members and guests in 1921.

The convention was featured by the presentation of an unusually large number of committee reports. Thirty-five of the standing committees of the society, all of which are at work revising present specifications and formulating new ones, reported during the convention.

George K. Burgess, the newly elected president, in an address said he would endeavor to make the standards of the society more generally applicable both in this country and abroad. The retiring president, C. D. Young in his annual address showed the great advantage gained in lowering cost of production by the use of recognized standards. He called attention to the broad scope of the society in this country in working in conjunction with other societies in formulating standards and said that the executive committee is considering ways and means of further circulating the *Proceedings* of the society in foreign countries so that American standards may become more generally known. An indication of the extent to which the standards are used in this country is shown by the fact that last year $18,000 worth of the society's literature was sold, amounting to nearly 28 per cent of the total income of the society for that year.

Following the action of the American Foundrymen's associaion at Rochester, committee *A*-3 passed a resolution recommending that the executive committee authorize committee *A*-3 to co-operate with representatives of other nations in the formulating of views regarding testing of and specifications for cast iron. Important action was taken on the reports of many other committees, as noted elsewhere on this and following pages.

While the technical program engaged the attention of members and guests most of the time, ample opportunity was given for recreation. The annual golf tournament was won by F. G. Breyer, New Jersey Zinc Co., Palmerton, Pa. Second prizes went to L. R. Ferguson, consulting engineer, Philadelphia; R. E. Griffith, Blair & Co., Philadelphia and W. Somer Hendricks, New Jersey Zinc Co., Palmerton, Pa. Other prizes went to J. E. Sanderson, Larkin Co., Buffalo; John A. Findley, Sterling Varnish Co., Pittsburgh; W. D. Price, Scovill Mfg. Co., Waterbury, Conn.; and G. D. White, Pittsburgh Plate Glass Co., Newark, N. J. R. W. Seabury, Boonton Rubber Co., Boonton, N. J., and N. P. Nemzek, E. I. Dupont Co., Philadelphia were awarded first and second prizes, respectively, in the tennis tournament, conducted at the same time.

Propose Changes in Iron and Steel Specifications

WROUGHT, gray and malleable iron subjects were treated at the afternoon meeting on Tuesday. H. E. Smith, chairman of the committee read the report of committee *A*-2, on wrought iron, which recommended revisions in standard and in tentative standard specifications for wrought iron products. Among the revisions adopted by the society is one to change the tensile requirements in the standard specifications for wrought-iron rolled or forged blooms and forgings for locomotives and cars. The former requirements of 22 per cent elongation in 4 inches, and 30 per cent reduction of area were changed to 24 and 33 per cent respectively for forgings, the requirements for blooms remaining the same.

The tentative specifications for lap-welded and seamless steel and lap-welded iron boiler tubes was revised in several respects.

A paper on merchant bar iron made by the busheled scrap process, written by W. M. Meyers, was read by H. E. Smith.

In discussing this paper James Aston cited the necessity of securing the proper scrap on account of the composite nature of the product, and said a method should be devised of differentiating the elements contained in the slag from those contained in the metal itself.

Results of numerous tests made to determine the proper method of notching bars in the nick-bend test for wrought iron were given by Henry S. Rawdon from a paper prepared by himself and Samuel Epstein, both of the United States bureau of standards, Washington.

Suggests Foundry Specifications

Previous to the report by the committee on cast iron, Richard Moldenke read a paper prepared by William R. Webster, consulting engineer, Philadelphia, in which Mr. Webster calls attention to the fact that there are no definite statements in the society's specifications for pig iron which would guide the foundryman in making light castings, medium castings, heavy castings or malleable iron, and suggests that the average chemical composition of irons for each weight of castings be decided upon, taking into account the different foundry methods in use for such work. Dr. Moldenke in discussing this paper said the foundryman should know what chemical composition he desires in his pig iron and the specifications should be necessary only to enable him to obtain the composition he desires.

In a written discussion of this paper prepared by H. V. Wille assistant to vice president, Baldwin Locomotive Works, Philadelphia, attention is called to the fact that the composition of castings of the same weight varies considerably according to the use they are to be put and cites the difference in composition of locomotive cylinders

from other castings of the same cross section.

The specifications for foundry pig iron proposed as tentative by Dr. Moldenke, as chairman of committee *A*-3, are a modification of the present standard specifications and give the limits of variation of each element from the amount specified in the order. As they stand they may be used for pig iron for gray-iron, malleable or steel castings. Objection was made to them by a number of steel foundrymen who claimed the limits of variation are too wide for pig iron to be used in the manufacture of steel castings, but the specifications were finally adopted as tentative by the meeting with the understanding that committee *A*-3 will consider changes in the specifications to make them more suitable to steel and malleable iron foundrymen before the meeting next year when they may be adopted as standard.

Phosphorus Limit Is Changed

New tentative specifications for chilled cast-iron wheels as proposed by committee *A*-3 were adopted. In speaking of these specifications J. C. Ramage, a member of the committee said that at the meeting last year the allowable limit for phosphorus had been discussed, and that during the year a number of tests had been made to determine whether phosphorus up to 0.4 per cent is detrimental to the wheel. As the objection to phosphorus iron it was decided to omit the statement in the specifications that it is desired that the phosphorus content shall not exceed 0.3 per cent.

Robert Job, vice president, Milton Hersey Co., Ltd., Montreal, said that a weight of 250 pounds for the tup is too light and cited tests made by the Lehigh Valley railroad during the past year in which a 400-pound tup was used, dropping 8 feet on the 650-pound wheel, 9 feet on the 700-pound wheel and 11 feet on the 750-pound wheel. These wheels stood an average of 6, 8 and 6 blows, respectively before breaking.

The other specifications, on high test, gray iron castings, proposed by committee *A*-3, requiring a tensile strength of 28,000 pounds per square inch and a transverse strength in the arbitration test bar of 3800 pounds, were accepted as tentative.

The report of committee *A*-7, on malleable castings, read by H. E. Diller, chairman, was accepted including proposed changes of the specifications for malleable iron. These changes included raising the requirements for tensile strength from 45,000 pounds per square inch to 50,000 pounds, and the elongation from 7.5 per cent in 2 inches to 10.0 per cent. The dimensions of the test bar also were changed.

Tentative specifications for carbon steel castings for railroads were proposed by committee A-1 on steel and adopted. Physical requirements of these specifications were set forth in a recent issue of THE IRON TRADE REVIEW. Important revisions of the standard methods of chemical analysis of plain carbon steel and of the standard methods of chemical analysis of alloy steels were proposed by this committee and adopted as tentative. Revisions in the following standards were proposed and adopted as tentative for one year: For steel track spikes; for lap-welded and seamless steel boiler tubes for locomotives; for welded and seamless pipe; for automobile carbon and alloy steels. It was recommended and accepted that the following tentative standards remain as tentative for another year: For steel tie plates; for carbon tool steel; for low carbon steel track bolts; for electric cast steel anchor chain; for cold-drawn steel wire for concrete reinforcement; for lap-welded and seamless steel and lap-welded iron boiler tubes.

It was reported that subcommittees of Committee A-1 on steel are considering the rail specifications; suggested revisions of the table of permissible overweight for structural plates ordered to thickness; revision of permissible tolerances for overweight in boiler plates and other questions involved in boiler steel specifications; specifications for high speed tool steel; specifications for cold finished shafting, etc. The sheet steel subcommittee has organized subsidiary committees on automobile steel sheets, galvanized roofing sheets, cold-rolled strip steel sheets, galvanized roofing sheets, cold-rolled strip steel and nomenclature and definitions. The subcommittee on steel reinforcement bars has arranged to be represented by C. F. W. Rys and E. E. Hughes on the special committee formed by the society to investigate deform bars for concrete reinforcement.

Discuss "Elastic Limit"

The term "elastic limit" when applied to annealed cast steel has little meaning, as this metal behaves as a plastic rather than an elastic material, according to a paper on "Tensile Properties of Steel Castings" read by Lawford H. Fry. This paper presented the results of some 600 tests from seven manufacturers.

H. F. Moore, in commenting on this paper, said it was clear that no single method of test could be adopted as standard for castings, rolled products and forgings. They do not lend themselves to the same method for best results, so that the selection of the method should depend on the particular application. J. R. Onderdonk said too much reliance should not be placed upon the results obtained from a small test piece. Even when the test piece shows up well, a large forging may develop strains that will have disastrous results. J. Lloyd Uhler endorsed this view, saying he had found differences of 2000 to 4000 pounds, due apparently to the difference in the rates of cooling of a small test-piece and of a large forging.

Sulphur Effect Not Marked

An extensive study of the effect of sulphur upon steel, with the sulphur both residual and added, was described in a paper read by George K. Burgess for the joint committee on the investigation of phosphorus and sulphur in steel. This paper was entitled "The Effect of Sulphur on Rivet Steel." Dr. Burgess said the joint committee preferred not to draw any formal conclusions from the data at this time, believing there is a possibility for further study. The results shown in the paper, however, appeared to indicate that the effect of the sulphur content is not very marked. In discussing this paper, Dr. J. S. Unger presented data on tests he conducted some years ago, which proved, he said, that high sulphur does not effect the physical characteristics. He showed that the changes in physical characteristics usually can be traced back to the manganese and carbon. Dr. Henry S. Rawdon also contributed a written discussion of this paper, devoting his remarks principally to results shown in impact testing.

A new recommended practice for heat treatment of carbon steel castings, to be substituted for the present recommended practice, was proposed by committee *A*-4 on heat treatment of iron and steel and accepted.

Electrical and magnetic methods of test show considerable promise in their application to butt-welded steel plates, according to a paper by T. Spooner and I. F. Kinnard. The authors detailed results of a preliminary investigation they had made, and while this investigation was restricted to butt-welds, it indicated that the use of electrical and magnetic methods will locate faults in welds irrespective of the type of weld.

Announcement was made that the executive committee had received a recommendation from committee E-6 on papers and publications asking it to give consideration to the desirability of holding two meetings a year hereafter, one as usual in June, for

the the consideration of standards and tentative standards, and a midwinter meeting, "which could be a technical session for consideration of papers on testing and research." Incidentally, in recognition of the growing amount of business at the society's meetings, simultaneous sessions were held at this convention for the first time.

The report of the executive committee also detailed the extent to which the society's standards have been approved as tentative American standards, and the extent to which the society is acting jointly with other organizations in the formulation of standards. An instance of such co-operation is the appointment of G. K. Burgess and Richard Moldenke as the society's representatives on the joint molding sand research committee which was organized under the joint sponsorship of the engineering division of the National Research council and the American Foundrymen's association.

Since this year marks the 25th anniversary of the society, the address of the retiring president, C. D. Young, was written in appropriate vein. It detailed the history and achievements of the society. When it had its inception in 1898, there was very little appreciation of the benefits of standardization, uniformity of testing and a common nomenclature. Since then, the society has produced standards covering nearly all of the important materials generally used in engineering construction. Mr. Young commented on the extent to which the general public benefits in various ways from the work of the society.

Preceding the president's address, resolutions were read detailing the careers and deploring the deaths during the past year, of Henry Marion Howe, past president and honorary member, Alfred W. Gibbs, past president, and Samuel Stockton Voorhees, past vice president.

To Undertake Thorough Study of Impact Testing

A NOVEL feature of the program was a symposium on impact testing of materials which occupied all of the Wednesday evening session. This symposium, the result of two years of planning, comprised a complete presentation of American practice in this important branch of testing. For one thing, it brought out the fact that there is not available as much definite information on impact testing as is desirable and the society plans to remedy this deficiency by making a thorough study of the subject in the future. In fact, the advisability of attempting the standardization of impact testing, now is under consideration. H. L. Whittemore opened the symposium with a resume of the history of impact testing, together with a bibliography of the subject.

Machines and test specimens used in impact testing were detailed by D. J. McAdam Jr., Thomas R. C. Wilson and Earl B. Smith. In their papers, these authors described the various types of machines and the test specimens employed in impact testing of metals and other materials. In the discussion of these papers, Prof. W. K. Hatt described the original machine he developed and he told of early methods of impact testing. Lawford H. Fry described the impact testing of full-size axles and shafts.

C. L. Warwick reported on the answers to a questionnaire on impact testing sent out by the society recently. This contained 12 questions which thoroughly covered the subject, and the questions were answered by 23 of the leading laboratories of the country. Mr. Warwick presented these replies in detail. A feature of some of the replies was that the writers felt it would be unwise to attempt standardization of impact testing at this time because it would curtail further research work.

The third section of the symposium was the presentation of papers by C. E. Margerum, Armin Elmendorf and H. F. Moore on the measurement of impact. In discussion, Earl B. Smith pointed out that there is little data in this country on the subject, and he said that the European data was much more complete.

Describes Fatigue Testing

Fatigue testing of metals occupied the center of interest in the session Thursday morning, centered on discussions of a paper on this subject prepared by H. F. Moore, J. B. Kommers and T. M. Jasper. The paper delivered by Professor Moore gives sketches of six machines used in conducting the long service of tests reported, and describes in detail, these machines, three of which were exhibited during the convention. Diagrams are shown indicating the correlation of endurance limit of steels, as determined in the fatigue test, with the proportional limit, with the yield point, and with Brinell hardness. In discussing the results of the endurance test Professor Moore emphasized the necessity of engineers taking into consideration all factors when deciding on a test.

L. B. Tuckerman in discussing the paper cited samples of low-carbon steel which had approximately the same composition and gave close results when tested statically, yet which showed varying results when subjected to the endurance test and suggested as a possible cause for this the difference in arriving at the surface finish, that is, whether heavy or light machine cuts had been taken, and based this assumption on the recognized distinct effect on the test of the degree to which a sample is polished before testing. A. L. Kimball, Jr., illustrated by colored slides the stress concentration in samples of different shapes made by testing transparent material and subjecting it to polarized light. Progressive changes of color are indicated as increased stress is applied and this gives an indication of correct or incorrect design of the piece tested.

Comparing the results reported in the paper, which were made on steel and wrought iron, with results of tests made by himself on nonferrous metals and alloys, R. L. Templin said that nonferrous metals do not have as definite a fatigue as the ferrous metals.

In answer to a question by J. H. Hall, Professor Jasper, one of the authors of the paper, said that the endurance limit of steel can be improved by heat treatment. He also stated that the correlation between the endurance limit and the elastic limit is not as close as between the former and the ultimate strength.

A report of progress including a number of suggested definitions relating to testing was submitted by committee *E*-1. Committee *E*-8, on nomenclature submitted a report outlining its work and indicating that much progress is being made in considering the definitions of the society.

Previous to the meeting on Thursday afternoon in which the reports of the committees on coal and on coke were given, A. C. Fieldner who was chairman of the committee on coal was elected chairman of the committee on coke and re-elected chairman of the coal committee. Therefore as the personnel of both the committees also was almost identical it was decided to recommend to the society that the two committees be united. The committee on coke recommended to the meeting a method for shatter test for coke to be adopted as tentative.

Steel Exports Gain 32,000 Tons

May Tonnage Totals 229,616, Highest in 15 Months—Nearly All Major Products Show Increase Over April Figures—Imports Also Gain and Tariff Prospects Are Reflected in Ores and Alloys

IRON and steel exports of the United States in May were 229,616 tons. This is the largest monthly total of shipments from this country since February last year. The tonnage is a sharp recovery from the slight decrease noted in the April exports, as compared with March. The May figure is 32,054 tons greater than April; is 23,142 tons more than the March 1922 tonnage, which was the highest total to date since February 1921; and is more than three times the export tonnage reported last August, which was 75,641 tons, the low point in the recent foreign trade depression.

Practically all of the major products presented by THE IRON TRADE REVIEW from the monthly compilations of the bureau of foreign and domestic commerce, showed an increase in May. Rails enjoyed the greatest individual increase in the month, totaling 23,812 tons after the 17,891 tons reported exported in April. This was a gain of approximately 6000 tons. Black sheets, in going up from 29,171 tons in April to 34,619 tons in May, increased more than 5500 tons.

Iron and steel bars and plates other than boiler plate each increased approximately 4000 tons in May. Plain structural shapes registered a gain of 3000 tons. Other structural forms, not included in the plain or fabricated tonnages, increased 2000 tons.

Only minor losses on individual products were reported in the May record. Losses were shown in only 14 products out of the 37 regularly reported. The greatest of these losses was in wire rods where the tonnage fell from 6998 in April to 4367 in May, a difference of 2631 tons. The other declines were small, that in railroad spikes being only 13 tons.

May imports continued in the upward trend. The report shows a total of 17,292 tons as against the bureau's revised figure of 10,915 tons for May last year. Compared with April this year, the May 1922 tonnage is an increase of 1408 tons.

Effects of the proposed tariff may be seen in the tonnage report of various ores and ferroalloys. The total for the month was 52,403 tons as against 28,395 tons in April. Manganese ore imports gained from 25,559 tons to 46,517 tons and ferromanganese increased from 2380 tons to 5218 tons. Imports of iron ore were 29,707 tons as compared with 2710 tons in April, the entire lot coming from Spain, Sweden, Canada and Cuba.

IMPORTS AND EXPORTS

Gross tons

	1922		1921	
	Imports	Exports	Imports	Exports
Jan.	10,511	155,822	15,784	516,447
Feb.	10,216	133,333	3,650	387,900
March	8,612	206,474	14,492	210,451
April	15,884	197,562	4,847	160,921
May	17,292	229,616	10,915	140,987
June			8,260	119,021
July			10,040	85,520
Aug.			8,069	75,641
Sept.			11,743	94,650
Oct.			10,609	106,466
Nov.			9,296	125,492
Dec.			9,400	134,348
Total	62,515	922,807	117,105	2,156,818

Year	Imports	Exports
1920	421,274	4,934,087
1919	822,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

FERROALLOY EXPORTS

Gross Tons

	May		Eleven months ending May	
	1922	1921	1922	1921
Ferrosilicon	42	2	363	525
Ferromanganese	41	.	966	3335
Spiegeleisen	1	.	339	....
Ferrovanadium	2	.	27	202
Total	86	2	1695	4062

IRON AND STEEL EXPORTS

Gross Tons

	May		Eleven months ending May	
	1922	1921	1922	1921
Pig iron	3,897	2,541	26,344	123,992
Scrap	12,804	4,146	51,136	178,891
Semifinished steel*	12,801	749	40,129	81,443
Iron and steel bars†	36,106	5,905	130,150	499,422
Alloy steel bars	174			
Wire rods	4,367	2,642	37,559	61,076
Boiler plate	2,173	18,518	97,749	753,248
Other plates	14,560			
Galv. sheets	9,488	3,043	71,456	90,214
Black sheets, steel	34,619	7,686	275,510	145,546
Black sheets, iron	584	(a)	5,917§	(a)
Cold rolled strips	275	916	20,234	37,104
Hoops, bands and scroll	2,264			
Tin and terne plate	6,292	1,393	70,394	175,574
Fabricated plates‡	137	419	3,031	30,138
Struc. steel, plain	8,620			
Struc. steel, fabricated	1,945	17,926	142,736	508,424
Other struc. forms	3,160			
Rails, over 50 pounds	20,152	23,492	111,532	529,250
Rails, under 50 pounds	3,660			
Railroad spikes	663	289	4,836	13,520
Track fastenings and material	2,348	(a)	10,241§	(a)
Boiler tubes	754			
Casing and oil line pipe	4,977			
Welded black pipe	6,918	40,821	141,480	413,957
Welded galv. pipe	2,938			
Malleable iron pipe fittings	778			
Cast iron pipe	1,188	4,123	29,628	72,430
Cast iron pipe fittings	743			
Plain wire	3,199	2,961	99,217	165,330
Galv. wire	9,636			
Barbed wire	7,548	1,027	33,160	85,181
Manufactures of wire	1,928	(a)	10,711§	(a)
Cut nails	292	28	2,179	3,433
Wire nails	5,797	710	46,412	72,762
Other nails including tacks	518	163	3,723	9,438
Bolts, nuts, rivets and washers	1,313	1,287	12,753	36,438
Total	229,616	140,987	1,478,217	4,086,811

*Includes ingots, blooms, billets, slabs, sheet and tin plate bars and sscelp.
†Includes rods other than wire, and light structural forms.
‡Ship and tank plates punched and shaped.
§Five months, separately stated.
(a) Formerly by value.

IRON AND STEEL IMPORTS

Gross Tons

	May		Eleven months ending May	
	1922	1921	1922	1921
Pig iron	4,476	2,874	34,622	48,069
Scrap	7,292	824	40,969	81,823
Bar iron	49	314	2,313	3,782
Ingots, blooms and billets	2,056	192	16,636	8,092
Structural shapes	237	73	1,372	1,322
Rails	2,962	6,254	22,519	34,998
Sheets and plates	34	359	305	2,734
Tin and terne plates	84	14	2,066	477
Wire rods	102	11	1,156	4,588
Total	17,292	10,915	122,158	185,885

IRON ORE IMPORTS

Gross Tons

From	May		Eleven months ending May	
	1922	1921	1922	1921
Spain	5,822	....	21,580	26,496
Sweden	12,590	49,407	40,507	157,833
Canada	95	285	3,835	19,182
Cuba	11,250	....	58,347	525,448
Other countries	....	9,012	6,333	197,231
Totals	29,707	58,704	130,501	926,109

IMPORTS VARIOUS ORES AND FERROALLOYS

Gross Tons

	May		Eleven months ending May	
	1922	1921	1922	1921
Ferromanganese	5,218	75	17,629	42,932
Ferrosilicon	588	182	9,493	6,841
Manganese ore	46,517	54,663	212,879	665,601
Tungsten-bearing ore	80	370	720	1,523
Nickel ore	....	....	149	17,333
Total	52,403	55,290	240,870	734,230

CASTING AND FORGING EXPORTS

Gross Tons

	May 1922	Five months of 1922
Malleable iron castings	115	619
Other iron castings	858	3,901
Car wheels and axles	686	6,653
Shells and projectiles, empty	12	169
Steel castings	194	989
Iron and steel forgings	188	876
Total	2,053	13,207

Alloys and Alloy Steels Favored

Ferromanganese Duty in New Tariff Bill Now $33.60 Per Ton—Manganese Ore at 1 Cent Per Pound—Alloy Steels Given Double Protection—Senate To Consider Measure During July

WASHINGTON, July 3.—Ferroalloy and alloy steel manufacturers have wrested from congress a measure of tariff protection not approached by any other division of the iron and steel industry. This statement is predicated upon the assumption that the senate proper will confirm the Fordney-McCumber bill rates approved by the senate sitting as committee of the whole, and that the senate-house conference on the completed bill will not furnish any overturns.

Manganese ore containing more than 30 per cent metallic manganese will be dutiable at 1-cent per pound of manganese content. Since this is the rate originally put into the bill by the house its final acceptance seems assured. In both the Payne-Aldrich act of 1909 and the Underwood act of 1913 manganese ore was on the free list. Imports of manganese ore in the pre-war year of 1913 totaled 387,196 tons, and in the post-war years of 1920 and 1921 amounted to 606,397 and 401,354 tons, respectively.

Molybdenum ore is dutiable at 35 cents per pound of metallic molybdenum. Like manganese ore, this ore has been on the free list. The house imposed a rate of 75 cents which the senate has halved. If any change is made in conference it would seem that a rate higher than 35 cents would result; in any event, the rate is certain to be at least 35 cents. Tungsten ore remains at 45 cents a pound, as the house proposed, and this appears to be the final rate. The Underwood act has been admitting this ore free; the Underwood act imposed 10 per cent ad valorem.

Will Accept Lower Rate

Ferromanganese now stands at the equivalent of $33.60 per gross ton, compared with the original house rate of $39.42. It is not believed the house will stand on its dignity and insist upon restoration of its slightly higher rate. The Underwood act lists ferromanganese on the free list, while the old Payne-Aldrich rate was $2.50 per ton. The exact rate now in the Fordney-McCumber bill is 1⅞ cents per pound and where the carbon content does not exceed 1 per cent 15 per cent ad valorem additional. Imports of ferromanganese in 1921 totaled 9077 tons; in 1920, 59,254 tons; in 1919, 33,022 ton, and in 1918, 27,168 tons.

Spiegeleisen is now dutiable at $1.25 per ton, compared with $2.50 in the Payne-Aldrich act and no duty in the Underwood act. As $1.25 also was the house rate in the present bill no change is foreseen. Where the house made 45 per cent manganese content the dividing line between spiegeleisen and ferromanganese the senate has substituted 30 per cent.

Ferromolybdenum and similar compounds of molybdenum have been protected to the extent of 50 cents per pound of molybdenum content and 15 per cent ad valorem. This is a reduction from the original house rate of $1.25 per pound plus 17 per cent, but when the senate pared molybdenum ore from 75 to 35 cents it necessarily reduced ferromolybdenum. Having left the 45 cent rate on tungsten ore unchanged the senate has accepted the senate finance committee recommendation of 60 cents per pound plus 25 per cent ad valorem on ferrotungsten. Under the Underwood act both ferromolybdenum and ferrotungsten have been dutiable at 15 per cent, so that even the reduction made by the senate in the house rates leaves them higher than at present.

The double-barrelled protection on the alloy steels remains. The Fordney-McCumber bill provides an extra duty of 10 per cent on steel in all forms and shapes containing more than 6/10 of 1 per cent nickel, cobalt, vanadium, chromium, tungsten, molybdenum or any other alloy except silicon and manganese. On top of this is an additional cumulative duty of 65 cents per pound where the molybdenum content exceeds 6/10 of 1 per cent and 72 cents per pound on a similar excess tungsten content. These extra rates are something new in tariff making and no similar provisions appear in any preceding tariff acts. The additional duty on molybdenum content represents a reduction from $1.25 because of the decreases in the senate on molybdenum ore and ferromolybdenum, but the tungsten rates stand as written into the bill by the house.

Ferrosilicon containing from 8 to 60 per cent silicon is protected to the extent of 2 cents per pound, from 60 to 80 per cent 3 cents per pound, from 80 to 90 per cent 4 cents and 90 per cent and over 8 cents. The Underwood act blanketed all ferrosilicon 15 per cent. The Payne-Aldrich act imposed $5 per ton on ferrosilicon containing not more than 15 per cent silicon, and 20 per cent on the remainder.

Bill Still Subject To Revision

Ferrochrome containing less than 3 per cent carbon, ferrovanadium, ferrotitanium, zirconium, chromium nickel, ferroboron and kindred alloys are made dutiable at 25 per cent by the senate, compared with 30 per cent in the house version of the bill and 15 per cent in the Underwood act, which is now in force. The Payne-Aldrich act made the duty 25 per cent when the value was less than $200 per ton, and 20 per cent over $200 per ton. Thus the proposed rates are at least equal to the Payne-Aldrich rates and in some cases higher.

Having obtained high rates on the raw material, the makers of high speed tools have obtained from the senate a rate of 60 per cent. As the Fordney-McCumber bill was written by the house, drills, reamers and similar tools took the basket-clause rate of 40 per cent, so the senate action represents an increase of 50 per cent.

The Fordney-McCumber bill of course still is subject to two revisions, one by the senate and one by the senate-house conference. The rates approved by the senate sitting as committee of the whole are practically certain to be sustained when the bill is considered the last time. The vote that approved the rates this time may be counted to sustain them provided amendments are proposed by the minority, which will be the case in some instances. What the conference will do is, at this time, pure speculation. The house decision to recess until Aug. 7 assures consideration of the tariff by the senate through most of July and makes its effective date late August at the earliest.

Dwight P. Robinson & Co., engineers and constructors, New York city, have entered into a contract with the Metropolitan Life Insurance Co., by which life insurance policies are provided without expense to all members of its organization under a group insurance plan.

Rail Wages Higher Than Manufacturing Wages

An analysis of the wages of railroad employes by the National Industrial Conference board, New York city, shows that the wage cut recently ordered by the United States railroad labor board leaves the four main classes of men affected with an economic status 18.7 per cent higher than their position in 1914.

Of the four classes affected, the car men stand at the top of the list with an increase of purchasing power of 33 per cent over the 1914 level, followed by unskilled labor, whose increase amounts to 19 per cent and that of the clerks and skilled shop mechanics 13 per cent.

The board reports that even after the new wage cuts go in effect railroad employes will still constitute a preferred class of industrial labor, as their increase in real earnings and their actual money, wages are still materially above the real wages and actual wages paid to employes of other industries performing a similar class of service.

The majority of railroad employes whose wages were ordered reduced after July 1 are included in the shop forces, the track laborers, the clerks and the signalmen.

While the average hourly earnings of railroad skilled shop employes under the new wage cut will be $.701, those of employes in the foundry and machine shop industry stood at $.561 on Jan 1, and the comparative average weekly wages stood at $33.67 and $25.08 for railroad and foundry and machine shop mechanics, respectively. The increase in real weekly earnings of foundry and machine shop employes over the 1914 level was only 5 per cent as compared with a 10 per cent increase for the railroad employes.

The same is true with regard to unskilled labor outside the railroad industry. The conference board's studies show that the average hourly earnings of unskilled laborers in other than the railroad industry were $.414 as compared with $.35 for railroad labor on Jan. 1, and the average weekly earnings of unskilled manufacturing labor were $19.04 as compared with $17.45 for railroad common labor. While real earnings for unskilled railroad labor increased 19 per cent in the eight-year period, those of unskilled labor outside of the railroad industry increased only 9 per cent. These increases are figured both for the railroad industry and for outside industries on the basis of the conference board's cost of living index for June 1, 1922, which shows that the cost of living at that time was 6.6 points lower than on Jan. 1.

Wages in Iron and Steel Industry Increase

Washington, July 3.—Pay envelopes of iron and steel works employes in the United States in May averaged $5.68 more than in April, according to reports to the bureau of labor statistics. Substantially all industries reporting to the bureau evidenced increasing pay in May, bearing out the general belief of a firmer wage condition. Barring a slight recession in March, the wage trend in the iron and steel industry has been steadily upward since January. In the automobile industry the rise since January has been unbroken. In the iron and steel, automobile, car building and repairing and bituminous coal mining industries January was the low mark and the trend since has been upward. The following table gives the average monthly earnings of workmen in represenative industries, the iron and steel data being supplied by more than 100 works each month:

	Iron and steel	Automobile	Car building and repairing	Bituminous coal mining
May	$93.80	$135.72	$115.70	strike
April	88.12	128.28	114.78	strike
March	89.02	113.12	114.82	$147.64
February	84.90	108.20	117.26	136.08
January	78.74	70.40	103.60	108.30
December	89.20	105.28	119.60	119.88
November	84.98	110.88	120.32	125.60
October	82.02	116.48	121.32	140.92

Says Public Favors End of 12-Hour Day

Washington, July 3.—Ninety per cent of the public opinion of the country is with the President in his desire to rid the steel industry of the 12-hour day, declared Secretary of Commerce Hoover a few days ago in addressing a social worker's convention at Providence, R. I. Secretary Hoover said concerning the 12-hour day:

"The President recently called a meeting of the leading steel manufacturers of the country and made an appeal to them in the name of social progress that they should take steps to abolish the 12-hour day which now remains in respect to about 15 or 20 per cent of the employes in that industry. For competitive reasons this abolishment needs be brought about coincidently in the whole industry and the President's action gains this opportunity for united action. This request was based solely upon social grounds and indeed the social necessity is sufficient justification for this or any other step. Many employers are in favor of it and I trust that this great step will be quickly brought about. I do not believe it is possible to develop proper citizenship or proper family life, whether men work 12 hours by necessity or by preference. And I think you will agree with me that 90 per cent of the public opinion of the entire country is solidly behind the President in his expression that we have now reached a stage of social conceptions wherein this anachronism should be abandoned."

Puddlers' Wages Raised 90 Cents Per Ton

Puddlers' wages in the mills represented by the Western Bar Iron association will be $8.53 per ton in July and August, compared with $7.63 in May and June. This was determined by representatives of the association and the Amalgamated Association of Iron, Steel and Tin Workers in Youngstown, O., June 28.

The wage at the peak in January and February, 1921, was $18.76, while the general average for the year 1914 was $5.60.

The average selling price in May and June was 1.60c, compared with 1.50c in March and April. Under the terms of the agreement which expired with June 30, the card rate of 1.60c would have resulted in a puddling wage of $8.03. The new agreement in effect with July 1 advances the base rate 50 cents per ton, thus giving the puddlers $8.53 for July and August.

The sales average for May and June was the same as the average for January and February. It was the first increase since the downward movement started in November-December, 1920. Additional comparisons follow:

	1922	1921	1920	1919	1918
Jan.-Feb.	1.60c	2.80c	2.55c	3.10c	3.10c
Mar.-Apr.	1.50c	2.55c	2.70c	2.75c	3.30c
May-June	1.60c	2.30c	3.00c	2.50c	3.35c
July-Aug.	....	1.85c	3.25c	2.50c	3.40c
Sept.-Oct.	....	1.70c	3.40c	2.50c	3.45c
Nov.-Dec.	....	1.65c	3.55c	2.50c	3.45c
Yearly av'ge.	....	2.14c	3.08c	2.64c	3.34c

Buyers Aiding Foundries Combat Strike

Buyers of heavy gray castings are co-operating with the four foundries in Cleveland which, as reported last week, are combating a strike of union molders demanding an advance from 62½ cents to 75 cents an hour. The foundries are fully manned with molders brought from other cities.

Molders in Boston also continue on strike. The rate for an 8-hour day in New Orleans has been reduced from $6.40 to $6. Wages for eight hours in other centers as of July 1 are as follows: Minneapolis, $6; Pittsburgh, $5.60; Indianapolis, $5.60; Detroit, $6; New Orleans, $6; St. Louis, $6; Cincinnati, $5.50; New York, $6 and Chicago, $6.

Winchester and Simmons Companies Unite

Plans have been announced for the consolidation of the Winchester Co., New Haven, Conn., and the Associated Simmons Hardware Companies, St. Louis, under the name of the Winchester-Simmons Co. The merger will be accomplished through the organization of a new company with a capitalization of $22,500,000.

The Winchester Co., itself a holding company controlling the Winchester Repeating Arms Co. and other concerns, has already acquired through the Mercantile Trust Co., St. Louis, 500,000 common shares of the Simmons company's 930,000 shares of common stock. Both of the merging companies will be represented on the board of directors, thus bringing them under one management. The Winchester company, it is understood, will operate as the manufacturing organization and the Simmons company as the distributing end of the combine.

The Associated Simmons Companies has stores and warehouses in St. Louis, Philadelphia, Boston, Minneapolis, Wichita, Kans., Sioux City, Iowa, Toledo, O., and New York City. The Winchester Co., organized in 1919 as a holding company for the Winchester Repeating Arms Co. and the Winchester Cutlery Co. and also to acquire a number of other firms occupying plants built during the war, produces and sells firearms, hardware, sporting goods, cutlery, tools and wrenches.

Steel Stockholders Fewer

The number of common stockholders on the books of the United States Steel Corp., now stands below the 100,000 mark, for the first time since 1920. At the time of closing the books for the June dividend payment the number totaled 99,512. This compares with 106,811, three months ago and with 107,439, the high record, established in December 1921. A small decline also occured in the number of preferred owners. The total is 81,865 compared with 81,621 in November.

American Car & Foundry Shows Good Surplus

The American Car & Foundry Co. in its report for the year ended April 30, 1922 shows surplus after charges of 4,483,320. Charges include federal taxes and preferred dividends. The total profits for the year was $9,051,71 against $13,212,816 in the preceding year. The company now has an accumulated surplus of $36,159,888. The balance sheet shows current assets of $48,583,536 and current liabilities of $10,999,868. The comparative income account follows:

	1922	1921
Total profit	*$9,051,721	$13,212,816
Rents, repairs, etc.	2,468,401	4,661,960
Net	6,583,320	8,550,856
Preferred dividends	2,100,000	2,100,000
Balance	4,483,320	6,450,856
Common dividends	3,600,000	3,600,000
Surplus	883,320	2,850,856
Previous surplus	35,276,568	32,425,712
Total surplus	36,159,888	35,276,568

*After providing for federal taxes.

Low Ore Tonnage Brings Higher Royalties

A great increase is noted in the amount of royalty per ton of ore paid in 1921 under what are known as the "old leases" of the Great Northern iron ore properties, the leases made prior to Jan. 1, 1913. Under these leases there was shipped from the Mahoning mine 303,020 tons of ore last year; from the Stevenson mine, 59,524 tons; Leetonia mine, 85,394 tons; Utica, 144,593 tons and the Sweeney, 113,369 tons. The receipts from the combined tonnage amounted to $179,623, which was equivalent to a royalty of 25.4459 cents per ton. This was an increase of 9.91 cents over the royalty in 1920 when shipments were 2,423,445.

Under the so-called "new leases" there was shipped in 1921 1,863,977 tons of ores, the total shipments under new and old leases in the year amounting to 2,768,641 tons. In 1922 under the terms of the leases the minimum required to be shipped is 6,098,677 tons.

Few changes with respect to the leases are noted in the annual report of the trustees. It is stated that during 1921 the Jackson Iron Mining Co. leased to the Orwell Iron Co., Cleveland, the property now known as the Orwell mine in Minnesota. The royalty rates are listed as 85 cents to $1 per ton. The Orwell Iron Co. is an affiliation of the Inland Steel Co. and the Brier Hill Steel Co. The Harrison Iron Mining Co. together with other fee owners and John A. Savage & Co., of Duluth, were negotiating a lease on property to be known as the Draper Annex mine.

The annual report of the Great Northern Ore Properties, shows total receipts of $6,088,663 from all sources. Total disbursements were $6,098,356, an excess over receipts of $10,293. After allowing for $207,767 undistributed receipts as of Dec. 31, 1920, the report shows undistributed receipts as of Dec. 31, 1921 of $197,473. Depression in the steel industry in 1921 caused a decrease in ore shipments from the company's mines to 2,768,641 tons as compared with 7,458,759 in 1920. Shipments last year for the first time in a long period were below minimums stipulated in leases, or 5,957,000 for 1921.

Files Bankrupt Schedule

Schedules in bankruptcy have been filed by the Aborn Steel Co., Inc., New York. Liabilities are listed at $236,000 and assets at $171,832. The main items of assets are real estate, $55,000; stock, $23,079; accounts, $24,662; unliquidated claims, $27,000. Principal creditors are Joseph T. Slingsnby, $54,863, secured; Bond & Mortgage Guarantee Co., $30,000, secured; Rutherford National bank, $16,000; Bergen County bank, $7000; and Standard Guage Steel Co., $7761.

Resumes Common Dividend

May earnings of the Central Steel Co., Massillon, O., of about $488,000 after bond interest were 18 per cent more than the April total. As a result of the improvement directors of the company have restored the quarterly dividend of 75 cents a share on the Common stock. This is the first dividend declared by the company since the merger which brought three plants under the name of the Central Steel Co. The company is operating at capacity, and is well booked in advance.

Plans Full Operations

Officials of the United Alloy Steel Corp. Canton, announce that the Canton Sheet Steel plant recently purchased will be used largely for the manufacture of automobile, electric and sheets for vitreous enamel. Full operations are to be inaugurated shortly. With the new acquisition, the United Alloy Steel Corp. has increased its manufacturing outfit to 22 open-hearth furnaces, 4 electric furnaces and 3 blooming mills, with a capacity of around 60,000 tons of ingots a month. The mill equipment includes 7 bar mills, 1 shape mill, 39 sheet mills and 2 jobbing mills. The galvanizing department will operate 18 pots.

The American Multigraph Co., Cleveland, has declared a quarterly dividend of 1¾ per cent on preferred stock payable July 1 to stock of record June 20.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WILLIAM J. GRUSS, who has been head of the pig iron sales department of Pickands, Mather & Co., Cleveland, since 1913 has resigned effective July 10. He will become manager of sales of the Gartland-Haswell-Rentschler interests, with headquarters at Dayton, O., and will take up his duties there Aug. 1. Mr. Gruss has been with Pickands, Mather & Co. for more than 28 years working up by gradual stages to his important executive position. He was born in Salem, O., April 10, 1878. He is widely known among pig iron manufacturers and has an extensive acquaintanceship in the foundry trade, bringing to his new position a broad knowledge of its requirements. He is a member of the American Iron and Steel institute and also of the Union club, Athletic club and Chamber of Commerce of Cleveland. He will be succeeded by George W. Striebing, who has been with the company for 11 years in the pig iron sales and ore sales departments.

Arthur J. Tuscany, who recently was elected secretary-manager of the Ohio State Foundrymen's association, with headquarters at 511 Wade building, Cleveland, has been treasurer, director of purchases and a member of the board of directors of the Whitney Tractor Co., an association he has maintained for the past two years. Prior to that he had been sales manager and a director of the Post Tractor Co., Cleveland. For eight years he was with the Johns-Manville Co., first as secretary to the branch manager; then he handled purchases and orders; next he went into the sales department and after some time in the field became assistant manager which position he held for three years. He was educated in the Cleveland elementary and high schools, spent a year in preparatory school and seven years in evening study, first on business subjects and later mechanical engineering.

R. D. Shields, chief engineer of the Ohio Machine Tool Co., Kenton, O., has been appointed assistant general manager of the company. He will continue as chief engineer.

Floyd H. Smith, formerly director of purchases of the Pierce Arrow Motor Car Co., Buffalo, has become associated with the Simms Magneto Co., East Orange, N. J., as assistant general manager.

Louis W. Olson, who was recently made a director of the American Foundrymen's association, was born in Wisconsin in 1878. He was graduated from the University of Wisconsin in electrical engineering in 1899. After engaging in construction work for two years, he became connected with the Ohio Brass Co., Mansfield, O., as draftsman. Later he was made factory superintendent, and in 1920 was appointed factory manager, the position which he holds at present. Mr. Olson was president of the American Institute of Metals in 1912 and 1913.

WILLIAM J. GRUSS

J. G. Barry, salesmanager of the General Electric Co. since 1917, and manager of its railway department for many years, and A. H. Jackson of the law department, recently were elected vice presidents of the company. Mr. Barry has been connected with the General Electric and Thomson-Houston companies for 32 years and is 52 years old. He was first employed in the production departent in 1890 and in 1894 entered the railway department in Schenectady. Mr. Barry worked up to the position of assistant manager and in 1907 was appointed manager. Mr. Jackson has been head of the law department for several years.

L. C. Bullington, who has been assistant to the manager of the power department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for the past several years, has been made assistant manager and will have charge of the general work of the department. Charles F. Lloyd, formerly manager of the substation section, has been made manager of the new electric division and R. E. Carothers, formerly manager of the turbine section, has been appointed manager of the new steam division. The vacancies caused by the promotions of Mr. Lloyd and Mr. Carothers have been filled by the elevation of Bruce H. Lytle and D. O. Tylee, the former becoming manager of the substation section and the latter manager of the turbine section.

Walter S. Goll has been made manager of the Fort Wayne, Ind., works of the General Electric Co. to succeed F. S. Hunting recently resigned. Mr. Goll was born in St. Louis, Mo., and was graduated from Sibley college, Cornell university, as a mechanical engineer in 1896. The same year he entered the service of the St. Louis & Suburban Electric railway. In April, 1897, he became connected with the railway engineering department of the General Electric Co. at Schenectady. In August, 1898, he became engineering correspondent with the Siemens Halske Electric Co., Chicago, which subsequently was purchased by the General Electric interests. Mr. Goll on April 1, 1901, became manager of the Chicago office of the Fort Wayne Electric Works, a General Electric subsidiary. Early in 1909 the Northern Electrical Mfg. Co., a subsidiary of the General Electric Co., was absorbed by the Fort Wayne Electric Works, and Mr. Goll was transferred to Madison, Wis., to become manager of that plant. In 1915 the Madison plant was sold to the Gisholt Machine Co., and Mr. Goll was transferred to Fort Wayne in February, 1916. In October, 1918, he was appointed assistant general manager.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ANSON W. BURCHARD, vice chairman of the General Electric Co., Schenectady, N. Y., has been elected president and chairman of the board of the International General Electric Co., succeeding Gerard Swope, its former president who recently was chosen president of the General Electric Co., and Charles Neave, chairman of the International company, resigned. Mr. Burchard has had a wide experience in international engineering, commercial and financial problems. He was born in Hoosick Falls, N. Y. April 21, 1865. After graduating from the Stevens Institute of Technology, 1885, with the degree of mechanical engineer, he engaged in general engineering work with the J. M. Ives Co., Danbury, Conn. and later became treasurer and manager of the T. & B. Tool Co., that city. Beginning in 1900, for the next two years he was vice president of the Cananea Consolidated Copper Co. In 1902 he joined the General Electric Co. and was comptroller until 1904 when he became assistant to the president. In 1912 he was elected vice president. In 1917 he was elected to the board of directors and this year was made vice chairman.

Arthur P. Davis, president of the Aluminum Co. of America, Pittsburgh, sailed for Europe recently.

B. H. Bristow Draper, vice president of the Draper Corp., Hopedale, Mass., has returned from Europe.

L. M. Brile of Brile & Ratner, 277 Broadway, New York city, dealers in non-ferrous metals, sailed for Liverpool June 22 to visit France, Norway and Germany on business.

Charles M. Schwab, chairman of the Bethlehem Steel Corp., has been elected president of the Chicago Pneumatic Tool Co., succeeding John R. McGinley, retired.

E. J. Byerlein now is operating the Milwaukee Foundry Equipment Co., 57 Erie street, Milwaukee. Mr. Byerlein formerly was sales engineer for the Osborn Mfg. Co., Cleveland.

Charles H. Bluske has been appointed district sales manager at 1304 Maltman avenue, Los Angeles, for the Economy Fuse & Mfg. Co., Chicago, succeeding George L. Davis. Mr. Bluske formerly was with the Pacific States Electric Co., Los Angeles.

Charles F. Blue Jr., vice president of the Carbon Steel Co., Pittsburgh, has been elected president succeeding Charles McKnight who has been made chairman of the board. Frank C. Neale has been elected vice president. Mr. Blue is vice president of the Kittaning Iron & Steel Mfg. Co., and also vice president of the Pittsburgh Iron & Steel Foundries Co.

J. R. Finklestein has been elected president of the Consolidated Steel & Iron Corp. with which the Hoosier Rolling Mills of Terre Haute has been merged and will have active charge, not only of the Terre Haute plant, but also of the properties in Missouri. The Consolidated corporation's headquarters are in St. Louis.

Henry Held has been elected president and treasurer of the Rundle Mfg. Co. and Wisconsin Sanitary Mfg. Co., Milwaukee, to fill the vacancy caused by the death of Robert T. Hazelwood. Mr. Held has been serving as secretary and treasurer. L. R. Kinnear is vice president; A. G. Held, secretary, and H. F. Goldammer, assistant treasurer. John A. Hazelwood has been elected a member of the board.

William Pigott, president of the Pacific Coast Steel Co., Seattle, and of the Pacific Northwest Foreign Trade council, has been appointed vice president of the American Manufacturers' association, succeeding H. S. Demarest, resigned. C. A. Lumb of the California Packing Co., and Lewis Williams of the Union Drawn Steel Co., Beaver Falls, Pa., have been elected directors of the council.

Arthur H. Quigley, for 12 years associated with the Kenosha, Wis., works of the American Brass Co., now owned by the Anaconda Copper Co., on July 1 was transferred to Toronto, Can., as general manager of the Bronze-Brass-Copper Rolling Mills, Ltd., Toronto, an Anaconda interest. Mr. Quigley will have complete charge of development work as well as the general supervision of existing plants. He joined the Coe Brass Co. at Torrington, Conn., in 1902 as an office employe, later becoming assistant to the president. In 1910 he was made office manager at Kenosha, and in 1917 he was appointed assistant general manager under Clark S. Judd.

Dr. Elwood S. Moore, dean of the School of Mines at the Pennsylvania State college for the past five years, has resigned effective in September, and will go to the University of Toronto to become head of the economic geology work. His successor has not yet been chosen. While at Penn State, Dean Moore has established mining extension work on a growing scale and started a mining experiment station. He also instituted a summer school at the college for miners.

A. H. Ferbert, continuously in the traffic department of the Pittsburgh Steamship Co., Cleveland, with which he became associated in 1904, effective July 1 was appointed traffic manager with headquarters in Cleveland. He succeeds Edward C. Collins who resigned to become assistant to Horace S. Wilkinson, chairman of the Crucible Steel Co. of America. H. C. Strom, who has been at Duluth, has been made western manager with headquarters there; D. C. Potts has been transferred from Duluth to Cleveland and R. J. Peachman has been sent to Duluth from Cleveland. F. I. Baker, who has been with the company since 1901, has been made first assistant under Mr. Ferbert.

F. J. Schlink, formerly of the development branch of the engineering department of the Western Electric Co., New York, has been appointed assistant secretary of the American Engineering Standards committee. The Electrical Manufacturers council has appointed A. L. Doremus, Crocker-Wheeler Co., New York, as alternate for A. H. Moore on the main committee; the gas group has named W. J. Serrill, United Gas Improvement Co., Philadelphia, as alternate for A. H. Hall; the navy department has designated Com. Harvey Delano, bureau of ordnance, Washington, vice Com. H. F. Leary; and the war department has named Maj. Glen F. Jenks, ordnance bureau, Washington, as alternane to Brig. Gen. W. S. Pierce.

Export Markets

For Steel Inactive—Japanese Rail Order Reported in England

New York, July 3.—Foreign trade activities in iron and steel in the past week developed little of interest to steel exporters. Markets which have been quiet for some time remain unchanged, with meager prospects of early trade resumption. Other markets which have been absorbing fair quantities of American steel seem to have reached the end of limited credits and are likewise assuming less importance. Prices for export are holding firm. Sustained domestic demand counteracts any tendency to offer undue concessions in favor of foreign inquiries.

Scattered sheet inquiries from Japan practically constitute all activity in the Far Eastern market. Small lots have been placed at prices which in view of current unfavorable Japanese credits and rather large inventories are considered unusually low. The majority of sheet inquiries from Japan are characterized as "feelers". A tight money market is forcing liquidation and holders of large stocks of sheets anxious to sell at minimum sacrifice are sounding the American market for replacement figures.

A number of sizable Japanese rail inquiries remain pending. One inquiry for seven miles of 20-pound rails reported a week ago and thought at that time to have originated with the government railways is now known to have come from private interests, and is rumored to have been placed with English makers. An order for six locomotives for the Chosen state railways is reported to have been placed with the American Locomotive Co. Small tin plate inquiries of odd sizes thought to be for oil can purposes are reported by some Japanese trading companies. Trade with the Philippine islands and Australia likewise appears to have dwindled to hand-to-mouth lots. One independent mill recently sold 75 tons of plain and barbed galvanized wire to Australia at a figure equivalent to about $3.25, seaboard per 100 pounds.

South American demand has dropped off materially. The Pacific railroad of Columbia will be in the market soon for a quantity of 55-pound rails said to exceed 10,000 tons. Some interest is being displayed by American construction firms in a proposed Bolivian railroad extension know as the Potosi Sucre line. No action will be taken on tenders for this project until September 1922.

Although South American shipping rates are formally announced to have been maintained, instances of cutting are not uncommon. Moderate steel tonnages are reported to have been booked to Argentine ports as low as $5 and $4.50 per ton. Exporters are uncertain as to what disposition will be made of present railroad freight rates on export shipments, in the general rate adjustment. Some are making future offers assuming a horizontal reduction of 10 per cent on all export shipments. Other exporters equally well informed look forward to an adjusted rate structure which will allow consignments for export a uniform 25 per cent preferential.

Obituaries

Patrick Doyle, treasurer of the Worcester Brass Co., Worcester, Mass., bronze, composition and brass castings, died recently.

Charles F. McGilvray, who recently was elected chairman of the Robbins & Myers Co., Springfield, O., electrical equipment manufacturer, following several years service as president and general manager, died June 27 at his home in Springfield. He had been ill several months. He was 73 years old, having been born Jan. 22, 1849, in Peterborough, N. H. He went to Springfield in 1884, joining the Robbins & Myers organization.

Walter H. Duckworth, assistant treasurer of the National Tube Co., Pittsburgh, died June 26 at his home in Ben Avon, Pa., after a long illness. He was born in Brooklyn, N. Y., where he received his early education. When a young man he entered the employ of the National Tube Co. in its New York office in the accounting and financial departments. He was promoted to the cashiership, which he held for 20 years prior to being made assistant treasurer five years ago. When the tube company moved its New York offices to Pittsburgh he was transferred.

Robert S. Harmer, president of the Sawyer-Massey Co., Hamilton, Ont., agricultural implement manufacturer, died June 26 at his home in Cedarvale, near Hamilton, following a protracted illness from pernicious anaemia. He was born in England and went to Canada at an early age. He entered the service of the Massey-Harris Co., Toronto, about 50 years ago. His promotions were rapid and he became general sales manager. Mr. Harmer gave this up to take up other interests, becoming president of the Sawyer-Massey Co.

Fritz Medal Is Awarded to Senator Marconi

Award of the John Fritz medal, one of the highest distinctions bestowed by the engineering profession in this country, has been made for 1922 to Senator Guglielmo Marconi, according to an announcement just made by the John Fritz medal board. The communication to Senator Marconi from Prof. Comfort A. Adams, Harvard university, chairman, and Charles F. Rand, secretary of the medal board, stated that the medal was awarded for the invention of wireless telegraphy. Formal presentation of the medal will take place before a large gathering of engineers from all parts of the country in the auditorium of the Engineering Societies' building, New York, Thursday evening, July 6. This meeting will be in the nature of an international celebration marking not only the advance of science but the progress of closer world relationships.

Prof. Adams will preside at the presentation ceremonies. Addresses will be delivered by James R. Sheffield, president of the Union League club, New York; Michael I. Pupin, Columbia university, New York famous for his inventions in wireless and Ambrose Swasey, Warner & Swasey Co., Cleveland. Previous to the presentation ceremonies, Senator Marconi will be the guest at dinner of the medal board of award at the Engineers Club, New York. The board, which named Senator Marconi as medallist was composed of leading American engineers including Herbert Hoover. The societies represented are: American Society of Civil Engineers; American Institute of Mining and Metallurgical Engineers; American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

Last year the award of the Fritz medal was made the occasion of a trip abroad of a mission of 13 distinguished engineers by whom the presentation was made personally to Sir Robert Hadfield of Hadfield, Ltd., London, and Charles Eugene Schneider of Paris, head of the Creusot works. The Fritz gold medal is presented for achievement in applied science as a memorial to John Fritz, American engineer, who was the first recipient. Other recipients of the medal have included Lord Kelvin, George Westinghouse, Alexander Graham Bell, Thomas A. Edison, Charles T. Porter, Alfred Noble, Sir William Henry White, Robert W. Hunt, John E. Sweet, James Douglas, Elihu Thompson, Henry Marion Howe, J. Waldo Smith, George W. Goethals and Orville Wright.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

KRYL & Eichelman is the name of a new fabricating company recently formed by the partnership of J. M. Kryl, president of the Kryl Bridge & Crane Co., Chicago, and W. H. Eichelman, until recently chief engineer of the Hamler Boiler & Tank Co., Chicago. Headquarters are at 2906-2918 West Twenty-sixth street, Chicago. The firm will engage in the fabrication of water tanks, oil tanks, stacks, process kettles for chemical equipment, and ornamental and structural iron and steel.

* * *

STORAGE batteries will be manufactured in Milwaukee by the Sundby Battery Co., which is moving its plant and offices to that city, where it will occupy the plant built for the A. C. Holtz Chemical Co. on the Cedarburg road. The Holtz company never operated the plant, which is of steel and steel sash construction and cost about $135,000.

* * *

AFTER Sept. 1, the Lamson Co., Boston and Lowell, Mass., will consolidate its office buildings and machine shops into three main buildings to be located at Syracuse, N. Y. With the exception of a sales office in Boston, the company's business will all be carried on in Syracuse. There will be a 2-story, 162 x 262 foot office building; a 150 x 300 foot machine shop and a 150 x 262 foot structural steel building.

* * *

GROWTH of the light tank business of the Wayne Tank & Pump Co., Fort Wayne, Ind., has led that company to expand the department. Contract has been placed with the Austin Co. for the erection of a 1-story building, 120 x 240 feet, which will be used as a light tank shop. According to C. G. Guild, secretary of the company, no new equipment will be required as the present equipment will be moved into the new building.

* * *

WITH a capacity of 70,000 horsepower, the largest hydro-electric unit ever built is embraced in an order received by the Allis-Chalmers Mfg. Co., Milwaukee, from the Niagara Falls Power Co., Niagara Falls, N. Y. It is said the largest similar unit ever constructed previously is exceeded by 15,000 horsepower in the capacity of the new unit. It will take a year to complete the generator. The unit will be 86 feet high and the casing will measure 55 feet from side to side, while the generator will be 30 feet in diameter and the generator shaft 34 inches in diameter. It will be installed under the steel arch bridge at Niagara Falls and consume 3600 cubic feet of water per second. The installation calls for three units, but the Allis-Chalmers design is the only one to be built in one shop. The work will be done at the main works in West Allis.

* * *

FORMERLY manager of the sandblast department of James Yocum & Son Inc., Philadelphia, H. B. Storey has acquired this department and established the firm of H. B. Storey at 145 North Second street, Philadelphia. Mr. Storey, whose experience in sandblast work includes also an association with the Tilghman-Brooksbank Sandblast Co., will specialize in engineering service, equipment and supplies connected with cleaning room work.

* * *

TATE-JONES & Co., Inc., Pittsburgh, furnace engineers, within the past few weeks have closed contracts 13 Costello patent continuous pair furnaces. Six of these were for the Wheeling Steel Corp., Wheeling, W. Va.; six for the Newton Steel Co., Newton Falls, O.; and one for the Superior Sheet Steel Co., Canton, O.

* * *

INCORPORATED under the laws of Pennsylvania as consulting and combustion engineers specializing in problems of fuel economy and conservation, and furnace design, the firm of Buell, Scheib, Mueller, Inc. has opened offices at 204 Columbia Bank building, Pittsburgh. W. C. Buell Jr. for the past two years was chief engineer of the liquid fuel department of the George J. Hagan Co. Prior to 1920 he was associated with Tate-Jones & Co., Inc. as engineer of experiments and tests and latterly as chief engineer. Walter H. Scheib for the past 12 years was associated with Tate-Jones & Co., Inc., and latterly as Pittsburgh district manager. Edward O. Mueller was associated from 1906 to 1915 with various steel companies including the National Tube Co., Ellwood City, Pa., Republic Iron & Steel Co., Youngstown, O., Carnegie Steel Co., Sharon, Pa., and the Lorain Steel Co., Johnstown, Pa. From 1915 to 1920 he was an engineer for the Koppers Co. engaged in design and research.

* * *

DISMISSAL of bankruptcy proceedings involving the Huffman Bro. Motor Co., Elkhart, Ind., manufacturer of motor trucks and passenger automobiles, has made possible the reopening of the plant, according to L. R. Huffman, treasurer and general manager. The company, organized at the close of the war, suffered from a top-heavy inventory, little available cash and considerable product in transit, when the recent industrial depression developed. W. L. Huffman is president of the company and R. E. Chiddister is in charge of manufacturing.

* * *

CONTRACTS have been taken by the Fuller-Lehigh Co., Fullerton, Pa., for two additional screen type mills for the Susquehanna Collieries Co., Lykens, Pa., and for three for the Sandusky Cement Co.'s new plant at Silica, O. The mills are 42-inch, gear driven. Those at Lykens, making a total of six installed there by the Fuller-Lehigh company, are used in pulverizing anthracite culm for the Collieries company's power plant which consists of six 600-horsepower boilers and six 500-horsepower boilers. The Cement company's mills are to be used in pulverizing coal for cement kiln and boiler fuel.

* * *

REORGANIZATION of the Electric Furnace Construction Co., 908 Chestnut street, Philadelphia, has been effected with the election of P. H. Falter as vice president and treasurer; Arthur G. Dickson as vice president and counsel; and John Gilbert, William A. Webb and Dr. T. H. Weisenburg as directors. Mr. Falter has been vice president and general manager of the Canadian Electro Products Co., Shawinigan Falls, Que., formerly was general manager of the Baltimore Electric Alloys Co., and was with the Aluminum Co. of America. He has also been general manager of the Shawinigan Electro Metals Co., Montreal.

Tool Prices Advance in June

Movement to Higher Levels Is Inaugurated During Month as Machinery Builders' Production Costs Rise—General Demand Was Fair—Scarcity of Desirable Used Machinery Enlarges New Tool Orders

INCREASED production costs are being reflected in the machine tool and equipment market by the stiffening of machinery prices. During June this was the outstanding development of the market, which to some extent, did not experience as active a demand as during May. While only a few tool builders have actually advanced prices a number are known to have issued notices of contemplated increases July 1. In addition prices for secondhand equipment stiffened during the month the latter situation being brought about not so much through increased demand as through the scarcity of desirable equipment. The latter phase of the market has reached such a point that many prospective used machinery buyers have been forced into the market for new equipment.

Most Orders for Single Tools

WHILE orders were not as numerous during June as in the preceding month some good sized business was done in all districts. Most business was of the single tool variety although a number of larger orders, involving from three to a dozen tools, were noted. The coal strike, it is thought, had an adverse effect upon tool buying all through the month, many regular buyers refraining from closing on inquiries through their inability to obtain satisfactory assurance of future fuel supplies. Toward the end of the month this situation was enhanced by the threatened railroad strike and while in the first two weeks of the month business was of fair size, demand during the latter half showed an appreciable decline. Buyers of more than one machine included the Bartlett-Hayward Co., Baltimore; the Walkerville, Ont., Collegiate; the General Electric Co., Schenectady, N. Y.; the Studebaker Corp., South Bend, Ind.; the Erie railroad; the Western Die Casting Co., Vallejo, Cal., and the Whitehall Portland Cement Co., Philadelphia.

Prospective Railroad Demand Is Large

THE volume of inquiry to come into the market during the month was large and included a number of sizable railroad lists. Most of the inquiries from the manufacturing trades, however, were for single tools and in the majority of instances called for secondhand equipment. Prospective demand from the railroads is large and lists either are in the market or contemplated for early issuance by the following roads: The New York Central; Lorain Ashland & Southern; Santa Fe; Missouri, Kansas & Texas; Burlington & Quincy; Illinois Central; Pennsylvania; the Wabash; the Seaboard Air Line; the Union Pacific; the Central Railroad of Vermont and the Rutland.

Large Industrial Demand in Prospect

BUYING by the railroads has been rather disappointing to the machine tool trade and for that matter orders from the general manufacturing trade have not been as numerous as inquiries would indicate. In addition to the prospective railroad demand a number of large inquiries are in the market from industry in general. Automotive inquiry is fairly large and there also is considerable business pending from school boards, etc. Included in prospective demand are lists from the General Electric Co., Schenectady, N. Y.; the Cleveland board of education; the Texas Co., New York; the American Gas & Electric Co., New York; the Franklin Mfg. Co., Syracuse, N. Y.; the International Harvester Co., Chicago; the Richmond, Cal., school board; the Mathew Stock Car Co., Chicago; the Endicott Forging & Mfg. Co., Endicott, N. Y.; the Otis Elevator Co., New York; the Rochlis Iron Works, Philadelphia; Crawford & Co., Philadelphia; the Pittsburgh Malleable Iron Co., Pittsburgh; the Warren Steel Car Co., Warren, Pa; the Greenville Steel Car Co., Greenville, Pa.; the Pittsburgh and New Castle, Pa., boards of education, and a number of others.

Desirable Used Tools Are Scarce

DUE to the growing scarcity of good used machinery, auction sales, etc., during the month were well attended. The scarcity of good used tools has been brought about through the placing back into operation many tools which had been put on the market by manufacturers who found need for them when orders began to come in. As a result new machine tool demand is better than at any time in more than a year and tool building shops are reflecting the betterment by increasing operations. In one tool building center, Milwaukee, it is known in at least one instance that demand has increased to such an extent that one builder is producing almost to capacity, and its operations would be larger were it not for a shortage of mechanics. Cincinnati reports that machine tool shop operations are on a broader scale and the same applies to Cleveland and the New England districts. Of considerable interest to the tool using trade at this time is the proposed sale during July and August to be held at the government warehouse in Chicago. The sale will include 1500 lathes, 70 grinders, 100 thread millers, etc.

Shop Operations Continue To Gain

METALWORKING shop operations continued to improve steadily during June although toward the latter part of the month there was a noticeable letup in general supply buying by the automotive trade. However, in some districts operations would be on an even higher level were it not for the fact a shortage of skilled and unskilled labor is prevalent, although in some districts labor is fairly plentiful. While the coal strike did not practically hinder operations, it is known that more steel mills and blast furnaces would be operating were it not for the fact future fuel supplies are uncertain. A similar situation was experienced by many foundries. Generally, however, operations during June were on a par with those of May.

Single Installations Dominate Crane Awards

CRANE orders during June were fairly numerous although in most cases but single installations were included in individual purchases. However, prospective demand for this class of equipment is large an indication of its size being given in the report of a Pittsburgh crane interest to the effect that in excess of 300 cranes are involved in the several projects before it. These include 128 cranes for the proposed Gary, Ind., tube plant of the National Tube Co., and 77 or 78 cranes for the proposed Hammond, Ind. plant of the Jones & Laughlin Steel Co. These two projects still are in the formative stage but action on them may develop soon. In addition there are numerous smaller inquiries in the market.

Railroad Tool Needs Feature

Buying Action Is Expected Soon on Numerous Railroad Equipment Inquiries—Several Additional Lists Current—Tool Prices Continue To Advance—Most Orders for Single Machines—Demand for Cranes Encouraging

DEFINITE action is expected shortly on the machine tool and shop equipment requirements of the railroads. During the past few days the New York Central added to its current inquiry bringing the list to 50 tools, while the Burlington & Quincy issued one calling for approximately 125 tools for its Denver shops. This list is in addition to one issued by the latter road several months ago. Buying action is expected on the lists of several other roads which have been pending in the market for months. The largest railroad buying reported recently was that of 25 tools by the Erie.

Stiffening prices continue to feature the equipment market. Effective July 1 several machine tool builders announced price advances one of these being Warner & Swasey Co., Cleveland. This interest advanced quotations on its various tools the new prices being from 6 to 12 per cent above those formerly quoted. Dealers generally are expecting price advances and it is thought practically all lines will be on a higher level before the end of the month. Increased demand is not so much the cause of the price advances, as the increased cost of production which has been steadily mounting higher.

Orders of the past week generally have been for single tools practically no buying of size being reported. However, one Cleveland manufacturer reports that among recent orders booked is one for 48 tools. Most of the orders being placed are of a confidential nature on which dealers will not give out information.

Probably the most encouraging feature of the equipment market is the number of awards for hoists, cranes and allied equipment, as indicated in the accompanying list of awards and inquiries. While most of the awards are for single installations it is to be noted that several are of larger size. Probably the largest buying of this type of equipment reported during the week was by the M. W. Kellogg Co., Jersey City, N. J., which placed orders for eight electric overhead cranes.

New York Central List Calls for 50 Machines

NEW YORK, July 3.—Additional inquiries have brought the New York Central list up to about 50 machine tools, the equipment being for several shops. At the same time, some orders are being placed, including a radial drill, awarded the American Tool Works, Cincinnati; an axle lathe, a 24-inch slotter and a 44-inch boring mill, awarded the Niles-Bement-Pond Co., New York; and three boring mills, reported to have been placed with the Bullard Machine Tool Co. Bridgeport, Conn. Other railroad inquiry calls for five machines for the Chesapeake & Ohio, including a 5-foot radial drill; two or three machines for the Delaware & Hudson, and

Crane Awards and Inquiries of the Week

Orders Placed

Eight overhead cranes for M. W. Kellogg Co., Jersey City, N. J., to Niles-Bement-Pond Co., New York, as follows: Two 20-ton, 4-motor cranes, 57 and 80-foot spans, respectively; three 10-ton, 3-motor cranes, two 57-foot spans, and one 62-foot span; two 7-ton, 3-motor cranes, 53 and 62-foot spans respectively; and one 5-ton, 2-motor crane, 27-foot span.

One 40-ton gantry crane for Phoenix Utilities Co., New York, to Cleveland Crane & Engineering Co., Wickliffe, O.

One 250-ton electric crane, 78-foot span, and two 15-ton electric overhead cranes for Erie railroad, the larger to the Morgan Engineering Co., Alliance, O., and the smaller two going to another builder.

One 20-ton locomotive crane for Vang Construction Co., Baltimore, to Browning Co., Cleveland.

One 20-ton locomotive crane for Hurwitz Bros., Syracuse, to Browning Co., Cleveland.

One 23-ton locomotive crane for a Brooklyn coal dealer, to McMyler-Interstate Co., Cleveland.

Three overhead cranes for Otis Elevator Co., Yonkers, N. Y., as follows: One 10-ton, 28-foot span, to Chesapeake Iron Works, Baltimore, and two, understood to be 3-ton cranes, to Shaw Electric Crane Co., Muskegon, Mich.

Three 2-ton overhead cranes and one 7½-ton crane, as previously reported, went to Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

One 5-ton electric crane, 68-foot span, for McIntosh-Seymour Co., Auburn, N. Y., to Niles-Bement-Pond Co., New York.

One 10-ton handpower crane for Davil & Averill, Waverly, N. J., to Chisholm-Moore Mfg. Co., Cleveland.

One 30-ton rebuilt locomotive crane, 50-foot boom, equipped with new 1½-ton bucket, for Cement Co., St. Louis, to Philip T. King, 30 Church street, New York.

One 30-ton rebuilt locomotive crane, 50-foot boom, equipped with new 1½-ton bucket, for Atlas Sand & Gravel Co., Hartford, Conn., to Philip T. King, 30 Church street, New York.

Two 5-ton cranes each with approximately 100-foot span for the Standard Plate Glass Co., Butler, Pa., to the Shaw Crane Works, through Manning, Maxwell & Moore, Inc., Pittsburgh.

One 5-ton crane for the Seneca Wire & Mfg. Co., Fostoria, O., to the Euclid Crane & Hoist Co., Euclid, O.

Four cranes instead of two as reported last week, for the Weldless Tube Co., Wooster, O., to the Alliance Machine Co., Alliance, O.

Three cranes, 5, 10 and 30-ton, instead of two as reported last week, for the Newton Steel Co., Newton Falls, O., to the Alliance Machine Co., Alliance, O.

Six 1-ton electric hoists, Cambria Steel Co., Johnstown, Pa.

Six 1-ton hoists from the Beckwith Machinery Co. Pittsburgh; two additional 3-ton hoists, Morrow Mfg. Co., Wellston, O.; two additional 3-ton electric hoists for the C. L. Miller Co., Scottdale, Pa.; one 2-ton electric hoist, American Steel & Wire Co., Newburgh works, Cleveland; one 2-ton crane trolley for the National Tube Co., Lorain, O.; one 3-ton hoist for the Garford Works Co., Elyria, O.; one 2-motor riveter monorail electric hoist for the Greenville Steel Car Co., Greenville, Pa., to the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Orders Pending

Five hoists wanted by the Edwin M. Hill Lumber Co., Penn avenue, Pittsburgh; bids in.

Two or more cranes for the Pennsylvania Lines west, Pittsburgh, bids being taken.

One 35-ton electric crane, 32-foot span, for Viele, Blackwell & Buck, 49 Wall street, New York; for installation at hydro-electric plant, near Timmins, Ont.

several heavy machines for the Long Island. The Pennsylvania railroad recently closed on two riveting machines, two vertical gear punches, two splitting shears, and several hydraulic bull riveters, the latter order reported as going to the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., and the two vertical punches, to the Southwark Foundry & Machine Co., Philadelphia. The equipment is for the Enola and Pitcairn, Pa., plants.

While inquiry has been more lively, it appears that buying in this district in June was little better, if anything, than in the preceding month. One or two of the larger dealers report that business was a trifle smaller. However the tone is stronger, and this is reflected by current trend of prices. Effective July 1, the American Tool Works, Cincinnati, increased quotations on radial drills 5 per cent, and the Warner & Swasey Co., Cleveland, on turret lathes, approximately 10 per cent.

Bids were opened June 29 on approximately 20 machine tools, including 10 lathes, for the Essex county vocational schools, Newark, N. J., but no awards as yet have been reported. The American Can Co., of that city, recently purchased a vertical milling milling machine from the Becker Milling Machine Co., Worcester, Mass.

Although new inquiry has been slack in the local crane market, several substantial orders have been placed, including eight electric overhead cranes for the M. W. Kellogg Co., Jersey City, N. J.

Prospective Tool Demand Encouraging

CLEVELAND, July 3.—While trading in the local machine tool and shop equipment market has been devoid of orders of size during the past week, dealers and manufacturers report the outlook exceptionally encouraging. One manufacturer, the Foote-Burt Co., reports that while a great majority of its orders are for single tools these are more numerous than ever, and several have involved a number of machines, one order in particular calling for 48. The Warner & Swasey Co. also reports the outlook encouraging and this interest, due to rising costs of production, on July 1, announced an advance on its various tools ranging from 6 to 12 per cent. During the past few weeks this latter manufacturer has booked a number of orders for export, but recently foreign demand has slumped off somewhat. Dealers throughout the district are encouraged as the result of the number of inquiries being received. As regards orders placed, more actual business is being done now than in many months. In the majority of instances orders are of a confidential nature and dealers will not give out information concerning them. A representative of the Pawling & Harnischfeger Co., Milwaukee, who during the past few days has been visiting the trade in this district reports that demand for his company's line of products at present is better than at any time in more than a year and only a scarcity of good mechanics in the Milwaukee district is stopping the company from inaugurating a night shift.

General industrial inquiry is confined in most cases to single tools but several for three and four machines are being worked on. These include one from the Guyan Machine Shop, Logan, W. Va., calling for a plate shear, a scroll saw, a gear cutter, an automobile cylinder grinder, a hydraulic press and a hydraulic wheel press. So far as can be learned the advance in price announced by the Warner & Swasey Co. is the only one made so far by manufacturers in this district.

Demand Reflects Improvement

MILWAUKEE, July 3.—The milling machine trade reports a distinctly better condition as the result of a period of improvement covering the last three months, of which June was appreciably the most important. Business has reached the point where some manufacturers are able to work on a 50 per cent basis, although the average is between 25 and 30 per cent. Nevertheless, this represents a respectable gain from the low point in effect for at least a year past.

Crane business is less restricted. At Green Bay, Wis., the Northwest Engineering Co. is encountering such a good demand for its crawler type of yard cranes that it is increasing its output 35 per cent.

Tool Demand is More Active

LOS ANGELES, June 30.—Demand for machine tools and equipment is more active in this section of the state than it is in the northern part. Orders continue confined to single tool requirements but larger ones appear to be more numerous than formerly. Many districts and counties have voted heavy school bonds outstanding among which is a $17,400,000 issue for Los Angeles schools.

The General Petroleum Co. recently placed an order with Herbert Machinery & Supply Co. for two 16 x 26-inch, one 26 x 42-inch and one 18 x 36-inch gear head motor-driven lathes. The Johnson Foundry & Machine Co. has purchased a 60-inch boring mill. The Harry Miller Mfg. Co., has ordered five lathes. Bids were opened on June 19 for a planer, a combination drill and tool grinder and a bench lathe for the Jefferson high school and five motor driven speed lathes for the Virgil junior high school. Included among sales is a heavy duty lathe to the Rice Ranch Oil Co. seven pipe and nipple machines, a radial drill, a 100-pound power hammer, and five lathes. The trade expects an award this week by the Navy department for a list of tools for the San Diego Air Naval station included among which are a motor-driven buffing lathe, two upright sliding head drilling machines, two emery grinding stands, one tool grinder, two shapers, one centering machine, one planer, one drill press, and 10 lathes. The Security Mfg. Co., Los Angeles has purchased nine automatics, a miller, three lathes and a grinder from the Herberts Machinery & Supply Co.

Price Advances Are Expected

BOSTON, July 3.—Practically no business of size has been done by local machinery dealers during the past weeks. Despite this fact there is a general feeling in the trade that the outlook for future demand is encouraging. Since the advance in prices, put into effect June 10 by the Hendey Machine Co. there has been more or less discussion of a general upward revision of prices but so far no additional advances have been made in this district.

With the exception of two small lists put out by the Boston & Albany railroad, there are no railroad inquiries current in this district. Small inquiries from the general manufacturing trade are being constantly received but no large lists are in sight. Sales of the week included a large universal milling machine to a Connecticut company, and a special thread milling machine to a Boston user.

Orders for Hoists Are Numerous

PITTSBURGH, July 3.—Hoist orders, as shown in the list of awards this week, have been numerous. Prices are stronger and while competition, particularly on cranes, is keen, a tendency is beginning to develop where builders endeavor to secure at least the return of the costs involved. A few new inquiries are up for consideration. These mostly are for single installations.

Action has been taken on the machine tool list of the Benjamin Franklin High school, New Castle, Pa.,

orders being distributed to several Pittsburgh sellers. Included in these purchases are a milling machine, drill press, etc., from William K. Stamets; two lathes from the McCoy-Brandt Machinery Co., while Somers, Fitler & Todd Co. will furnish the motor-driven floor grinder, milling and drilling machine, hack saw, motor driven air compressor, soldering furnaces, chucks, tools, etc. Other orders have been placed for a number of lathes. Action is about to be taken by the Pittsburgh board of education on some band saws, 10-12-inch lathes, one planer, shaper and milling machine, and by the McKeesport board of education on a band saw and a grinder. Most buying is being quietly negotiated without formal inquiries or lists being distributed. One of the largest recent sales consummated in this way involved approximately $6500 of punching and shearing equipment by a Pittsburgh district user. Other sales, include a lathe, punches and shears, a small lathe, a 20-inch drill, a 60-inch boring mill, a 16-inch lathe, a punch press and equipment for a garage including a lathe, two drills, grinder, etc. A few of these items were used machines for which demand appears to be heavy although buyers strive for bargains. The Westinghouse Electric & Mfg. Co., which is understood to be planning to build a tin shop at Trafford City, Pa., has an inquiry out for hand shears. It continues to ask for single items for its various subsidiary companies from time to time. Two or three inquiries are out for shears, including one from a Buffalo user.

While June has been a fair selling month, it has not compared with May due to the abrupt falling off in buying noticed early in the month. Due to pressure being brought to bear upon managements in various directions, however, for needed machine tool and other equipment, July and possibly August are expected to compare favorably with the past two months whereas usually these summer months are exceedingly quiet. The inquiry of the Stonecrete Corp., 6023 Penn avenue, Pittsburgh, has been revived calling for two drill presses, two engine lathes, one shaper, a band saw, a boring mill and a punch and shear. One or two small railroad inquiries are current, mainly from the northeastern Ohio territory.

Railroad Demand Is Promising

CHICAGO, July 3.—The Santa Fe and the Illinois Central railroads are on the verge of placing their heavy lists of machine tool requirements. A list, within the past few days has been issued by the Burlington railroad for more than 100 tools for its shops at Denver. This list is in addition to this road's former general list for tools to be distributed to its various shops. The general list has not yet been closed, but promises to yield business during July. The Union Pacific railroad has also put out a list of machine tool requirements, but these will be bought at Denver, and do not interest Chicago sellers except in a few instances.

Buying generally is increasing, although some sellers find the vacation season hindering sales somewhat. Present business is practically all in single tools and from widely scattered sources, no generalizations being possible. The tendency toward higher prices continues and it is generally believed that July will see a level about 10 per cent above present prices. A manufacturer of lathes, millers, shapers and other tools has announced a 10 per cent advance on lathes. The Joliet board of education has just placed 28 machine tools for its manual training department, one seller being given 14 tools and the remainder was divided among three others.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BESSEMER, ALA.—The Nashville Bridge Co., Nashville, Tenn., is reported planning to establish a plant here for the construction of steel bridge parts.

ENSLEY, ALA.—The Tennessee Coal, Iron & Railroad Co. is reported planning to remodel its foundry for the manufacture of ingot molds and iron castings.

FAIRFIELD, ALA.—The Chickasaw Shipbuilding & Car Co. is reported planning a modern foundry building.

BRIDGEPORT, CONN.—The Remington Cutlery Works, Inc., incorporated May 15, has increased its capital stock from $25,000 to $1,500,000.

HARTFORD, CONN.—The Twin State Gas & Electric Co. has increased its capital stock from $6,000,000 to $8,000,000.

LITCHFIELD, CONN.—The Bantam Ball Bearing Co. plans a factory addition at a cost of $150,000.

MERIDEN, CONN.—The Fire Protection Corp. of New England, Inc., has been incorporated to make fire apparatus with $10,000 capital by Charles N. Flagg, Kenneth C. Woodward and Thomas P. Dunne.

TORRINGTON, CONN.—The Torrington Electric Light Co. plans a steam power plant.

TALLAHASSEE, FLA.—The West Florida Power Co. has been incorporated with $1,000,000 capital stock by B. H. Hardaway Sr., B. H. Hardaway Jr., C. A. Mees and others.

CHICAGO—E. Edelman & Co. are having plans prepared for a 2-story factory building, 150 x 250 feet, to be devoted to the manufacture of automobile accessories.

CHICAGO—Steel Exchange of Chicago, Inc., 25 North Dearborn street, has been incorporated by Aaron Charnik, Bessie Charnik, and others, to deal in sheets and strip steel.

CHICAGO.—The Duke Nut Lock Co., 69 West Water street, has been incorporated with $10,000 capital stock by George H. Duke, George E. Gibson and George H. Duke Jr. The company is represented by Hoyne & O'Connor, 105 West Monroe street.

ROCKFORD, ILL.—The J. L. Clark Mfg. Co. plans a factory addition, 1-story, 60 x 190 feet.

ROCK ISLAND, ILL.—The Service Rubber Co., 401 Central Trust building, plans a factory building, 3-stories, 60 x 200 feet, to cost about $100,000.

CAMBRIDGE CITY, IND.—The Bertsch Co. is reported planning a 1-story plant addition, 30 x 100 feet.

INDIANAPOLIS—The Chapman Price Steel Co. is reported planning a steel mill building.

INDIANAPOLIS—The Rockwood Mfg. Co.

plans a machine shop, 1-story, to cost about $40,000.

PETERSBURGH, IND.—The Simplex Lock Rim Co. plans an addition to its plant, 30 x 70 feet, for the manufacture of metal rims for automobile wheels.

PRESQUE ISLE, ME.—The Maine & New Brunswick Power Co. plans to make power plant improvements.

McCALLS FERRY, MD.—The United Gas & Electric Corp., New York, plans to establish a hydroelectric plant on the Susquehana river.

AMESBURY, MASS.—The Amesbury Electric Light Co. is reported planning improvements and additions to its plant.

BOSTON.—The National Can Co., 36 Washington street, plans a 2-story factory building, 100 x 175 feet at Dorchester, Mass.

BOSTON.—B. F. Smith & Co., 79 Milk street, plan a 1-story machine shop, 50 x 70 feet at Somerville, Mass.

PITTSFIELD, MASS.—The Eaton, Crane & Pike Co. has been incorporated with $3,500,000 capital to build machinery, by Arthur W. Eaton, William H. Eaton, Felix Rackemann, Milton, Mass., and others.

SOUTHBRIDGE, MASS.—Joseph Richards plans a 100 x 200-foot factory for the making of knives.

WALTHAM, MASS.—The George W. Hoar Co. has been incorporated with $25,000 capital to deal in metal goods and machinery, by George W. Hoar, and James E. Cussen and John J. Donovan, both of Boston.

DETROIT—The Wilson Body Co. plans a factory building to cost $200,000.

DETROIT—The Burr Pattern Co. plans a factory building, 2-stories, 40 x 100 feet, to cost about $40,000.

JACKSON, MICH.—The plant of Glick & Schopk, scrap iron, recently was damaged by fire.

VICKSBURG, MISS.—The Electriclock Mfg. Co. has been incorporated with $100,000 capital stock by W. Hemingway Jr., W. L. Jacquith and others.

NEWARK, N. J.—Contract has been awarded the Truscon Steel Co. by the Essex Foundry for an addition to its plant, to be 100 x 120 feet.

TRENTON, N. J.—The Freeman Electric Co., 803 East State street, plans and improvements to a building at Mead and Prince streets, which it will equip as a plant.

BROOKLYN, N. Y.—A $50,000 garage, 1-story, 100 x 100 feet, will be erected by the Krause Motor Co.

BROOKLYN, N. Y.—The Thatford Iron Works has been incorporated by F. Rauch, D. Romanik and A. Cohen. The company is represented by J. J. Levine, attorney, 291 Broadway.

BROOKLYN, N. Y.—The Peterson Machine Co. has been incorporated with $50,000 capital stock by C. A. Peterson, L. A. Larsen and others. The company is represented by A. R. Boyd, attorney, 165 Broadway.

BROOKLYN, N. Y.—Rodolitz & Schrierer have been incorporated to make electric fixtures, with $10,000 capital stock by M. and H. Rodolitz and M. Schrierer. The company is represented by M. L. Kane, attorney, 50 Court street.

BUFFALO—The Sainsbury Manifold Heater & Cooler Co. has been incorporated with $100,000 capital stock by M. H. Reid, G. F. Yates and J. T. Sainsbury. The company is represented by T. E. Boyd, attorney.

DUNKIRK, N. Y.—The foundry of the Continental Heater Co. recently was damaged by fire.

JAMESTOWN, N. Y.—The Ulrich Plan File Co., 516 West Fourth street, plans a factory building for the manufacture of filing equipment to be built at a cost of $18,000.

LONG ISLAND CITY, N. Y.—The Whitaker Glessner Co. plans a warehouse, 6-stories, 120 x 140 feet.

NEW YORK—The Crescent Woodworking Corp. has increased its capital stock from $5000 to $20,000.

NEW YORK.—Benjamin Fox's Sons, 513 West Thirty-fourth street, plans a 2-story plant addition, 25 x 100 feet.

NEW YORK.—The New York Steam Co., 280 Madison avenue, is reported planning extensions and improvements to its plant.

NEW YORK—The Chambers Hardware & Tool Co. has been incorporated with $20,000 capital stock by M. Feur, I. Marcus and A. Ginsberg. The company is represented by N. Permut, 82 Duane street, attorney.

NEW YORK.—Barker Bros. have been incorporated to make machinery with $25,000 capital stock by E. V. and E. J. Barker. The company is represented by W. E. Cook, attorney, 1133 Broadway.

NEW YORK.—The Utility Can Co. has been incorporated with $150,000 capital stock by M. H. Campbell, M. M. Manning and A. R. Resleo. The company is represented by E. T. Murdock, attorney, 120 Broadway.

ROCHESTER, N. Y.—The American Woodworking Machinery Co. plans a foundry building, 110 x 130 feet, at an estimated cost of $18,000.

CUMNOCK, N. C.—The Rocky River Power & Light Co. plans to establish a hydroelectric plant.

AKRON, O.—The Standard Mold Co. is reported planning an addition to its plant.

BELLAIRE, O.—The C. L. Dorer Foundry Co. plans a foundry addition, 1-story, 36 x 60 feet.

CANTON, O.—The Wireless Manufacturing Co. has been incorporated with $50,000 capital stock, by Louis N. Ley, Henry L. Ley, and others.

CLEVELAND—The Superior Brick Co. is constructing an addition to its plant, 120 x 420 feet. The addition will increase the plant's capacity from 50,000 to 100,000 brick a day.

COLUMBUS, O.—The Modern Show Case & Fixture Co. has acquired a site on which it plans a modern factory building.

FREMONT, O.—The plant of the Kelly Island Lime Co. recently was damaged by fire.

NILES, O.—Work has been started on an addition to the plant of the Youngstown Steel Car Co., to cost $60,000.

TOLEDO, O.—The Industrial Steel Castings Co. has purchased a site adjoining its plant.

WOOSTER, O.—Work will be started soon on a plant for the Weldless Tube Co., the building to be 110 x 525 feet.

BETHLEHEM, PA.—The Bethlehem Foundry & Machine Co. has purchased the Wedge

April Metalworking Tool Exports Decline

FIGURES compiled by the United States department of commerce bureau of foreign and domestic commerce show total exports of lathes, boring and drilling machines, planers, shapers and slotters, and milling machines in April, fell off as compared with those in March. During April the total number of tools of these types exported were 231 valued at $114,164 which compares with 341 tools valued at $203,350 in March. In April 70 lathes valued at $45,608 were exported, 125 boring and drilling machines valued at $25,280, 19 planers, shapers and slotters valued at $25,685 and 17 milling machines valued at $17,591, which compare with exports in March of 113 lathes valued at $106,651, 168 boring and drilling machines valued at $51,097; 19 planers, shapers and slotters valued at $19,885 and 41 milling machines valued at $25,-817. The following table shows where the tools were distributed among the various countries during April:

Countries	Lathes No.	Lathes Dollars	Boring and drilling machines No.	Boring and drilling machines Dollars	Planers, shapers and slotters No.	Planers, shapers and slotters Dollars	Milling machines No.	Milling machines Dollars
Belgium	..	....	1	2,100	..	....	..	....
France	..	....	5	2,100	5	5,869	7	5,728
Netherlands	..	....	1	181	..	....	..	....
Switzerland	1	304	..	....	..	....	..	....
England	7	4,666	14	352	..	....	3	4,938
Canada—								
Maritime Prov.	1	40	..	....	1	743	..	....
Quebec & Ontario	17	1,331	47	5,280	2	675	1	810
Prairie Provinces	2	314	1	107	..	....	..	....
Honduras	2	4,237	1	245	..	....	..	....
Mexico	5	1,109	3	280	2	645	..	....
Cuba	2	1,946	..	....	1	1,200	..	....
Haiti	..	....	..	....	1	281	..	....
Bolivia	2	2,877	..	....	..	....	..	....
Colombia	..	....	1	163	..	....	..	....
Peru	..	....	4	42	..	....	1	1,425
British India	1	350	10	270	..	....	..	....
China	12	15,747	2	740	..	....	1	2,400
Japan	7	10,945	15	13,067	6	16,187	4	2,290
Philippine Islands	1	55	..	....	..	....	..	....
Australia	5	1,006	12	226	..	....	..	....
New Zealand	5	681	8	127	1	85	..	....
Total	70	45,608	125	25,280	19	25,685	17	17,591

Mechanical Furnace Co. Some alterations are contemplated.

INDIANAPOLIS.—The J. S. Holliday Realty Co., organized by the W. J. Holliday & Co., to acquire property for that company, has purchased a tract 48 x 195 feet.

DETROIT.—The Lincoln Motors Co. plans to erect an addition to its plant 1-story.

JACKSON, MICH.—The Barnswell Mfg. Co. plans the erection of a factory building here.

RIVER ROUGE, MICH.—A 1-story factory building, 90 x 200 feet, will be built by the Ford Motor Co.

CANONSBURG, PA.—The Canonsburg Steel & Iron Co. plans a factory building.

CORAOPOLIS, PA.—The Standard Steel Spring Co. plans a 1-story plant addition, 65 x 140 feet.

GREENVILLE, PA.—The Greenville Steel Car Co. is building an addition to its plant.

LANCASTER, PA.—The Lancaster Electric Light, Heat & Power Co. is reported planning extensions and improvements to its plant.

LEBANON, PA.—The Keystone Foundry Co. has been incorporated with $50,000 capital stock by John G. Kreider, and others.

MILLERSBURG, PA.—A generating plant will be erected by the Beaumont Electric Co. on a recently acquired site, now occupied by a flour mill.

NEW CASTLE, PA.—The Elliott Blair Steel Co. is reported planning a number of plant buildings..

PHILADELPHIA—Thomas Savill & Sons, 1310 Wallace street, plans a foundry, 2-stories, 42 x 60 feet.

PHILADELPHIA.—The Firth & Foster Co., Emerald and York streets, plans a power house, 1-story, 30 x 65 feet.

PHILADELPHIA—The Barrett Metal Products Corp. has been incorporated with $10,000 capital stock by Edward Kolsky, Ninth and Walnut streets, and others.

PHILADELPHIA—Contract for a $40,000 machine shop and storage building for the James H. Billington Co., has been awarded to F. L. Hoover & Sons, Inc.

POTTSVILLE, PA.—The Eastern Pennsylvania Light, Heat & Power Corp. has awarded a contract for an electric generating plant.

SCRANTON, PA.—The Scranton Electric Co. is reported planning additions and improvements to its plant.

SCRANTON, PA.—The Hanover Power Co. is reported planning extensions and improvements to its plant.

SOUTH WILLIAMSPORT, PA.—The Keystone Friction Hinge Co. has been incorporated with $200,000 capital stock by V. C. Luppert, and others.

SUNBURY, PA.—The Sunbury Water Co. plans a boiler house, 1-story, 50 x 50 feet.

WARREN, PA.—The Warren Steel Car Co. plans to rebuild the part of its plant which was recently damaged by fire.

WRIGHTSVILLE, PA.—The Susquehanna Casting Co. plans a foundry at New Oxford, Pa.

PROVIDENCE, R. I.—The R. I. Metal Products Corp. has been incorporated with $10,000 capital by Charles Z. Alexander, E. R. Alexander and Francis A. Cullen, Cranston, R. I.

FRIENDSHIP, TENN.—The Friendship Light & Power Co. has been incorporated by J. T. Carman, L. F. Dunagan and W. C. James.

JOHNSON CITY, TENN.—The Crescent Tube & Tinning Co. has increased its capital stock to $50,000.

CLARKSVILLE, VA.—The Clarksville Farmers Implement & Supply Co. has been incorporated by S. G. Chandler, H. A. Noblin and others.

SCOTTSVILLE, VA.—The Big Bend Power Co. plans a hydroelectric plant on the James river.

CLAY, W. VA.—The Elk Utility Co. has been incorporated with $25,000 capital stock by Parley DeBerry, S. W. Brant, James Reed and others.

HUNTINGTON, W. VA.—The Consolidated Light, Heat & Power Co. will construct a power station, two stories, 28 x 64 feet.

ASHLAND, WIS.—The Chicago & Northwestern railroad plans the erection of a 13-stall roundhouse costing $60,000.

BEAVER DAM, WIS.—Barn, dairy and farm equipment will be manufactured by the Mid-West Mfg. Co. recently organized with $30,000 capital stock by M. B. Bulger, W. R. Zimmerman and C. A. Friday.

HUDSON, WIS.—To build and operate hydroeletric plants is the purpose of the Willow River Power Co., incorporated here with $500,000 capital stock by Albert P. Schultz, F. P. Buarkhardt and B. A. Burkhardt.

KENOSHA, WIS.—A 4-story garage, 56 x 150 feet, costing about $100,000, is planned by the Long Motor Co., 464 Park street.

MADISON, WIS.—The Wisconsin Power, Light & Heat Co. has increased its capital stock to finance additions to its power plant, gas works, etc.

MILWAUKEE—Bids are being asked by the Milwaukee board of industrial education for furnishing and installing 2000 steel lockers in the central continuation school at Sixth, Seventh, Prairie and State streets.

MILWAUKEE—A 1-story and basement garage and repair shop, 49 x 129 feet, will be erected at Twenty-ninth and Center streets by Martin Froelich, 779 Sixth street.

MILWAUKEE.—Articles of incorporation have been filed by the Milwaukee Vending & Mfg. Co., capital stock, $25,000. A shop is being opened at 1261 Kinnickinnic avenue. The incorporators are Robert W. McCormick, R. F. Downey and William O'Brien.

MILWAUKEE.—Paul Riesen's Sons Co., 1084 Humboldt avenue, is the successful bidder for the construction of a steam power plant and boiler house for the new sewerage disposal plant to be erected by the city on Jones island.

MILWAUKEE.—A machine shop, 30 x 150 feet, will be erected at Thirtieth and Chambers streets by the Badhe Mfg. Co., 2621 Vine street, which has been incorporated to develop and manufacture inventions of mechanical devices on a royalty basis for the inventors.

NEKOOSA, WIS.—The main shop of the Nekoosa Iron Works recently was damaged by fire.

Business Changes Recently Announced

PILLING & Co. have been appointed exclusive sales agents in New England, New Jersey and a portion of the metropolitan district, for the Stephenson Charcoal Iron Co., Wells, Mich., and are authorized to sell this product in all other territory east of Indiana.

* * *

The Iron & Steel Products Co., 230 Fifth avenue, Pittsburgh, has removed its office to 421 Wood street, that city.

* * *

Headquarters of the Steyn, Pease Co., iron, steel and hardware agent, have been moved from 100 Church street to 300 West Fifty-six street, New York.

* * *

Ampco Twist Drill Co. is the new name of the American Machine Products Co. Detroit, which will continue to manufacture twist drills and kindred tools.

* * *

The Herman Nelson Corp., Moline, Ill., has opened offices at 2036 East 105th street, Cleveland; 110 West Augusta avenue, Spokane, at Denver and at Kansas City, Mo.

* * *

The Eureka Fire Brick Works, First National Bank building, Pittsburgh, has been appointed sales agent in western Pennsylvania and Ohio for the A. P. Green Fire Brick Co., Mexico, Mo.

* * *

Effective July 1 the Standard Inspection Co., Pittsburgh, moved its offices and testing department to the ninth floor of the Century building, Seventh street, Pittsburgh.

* * *

Purchase of a building at Third street and the Lehigh railroad, Reading, Pa., recently was effected by the Penn Engineering Co., that city, manufacturer of vise posts, pipe benders, etc.

* * *

The E. L. Essley Machinery Co., Chicago, has been appointed agent in the Chicago district for the line of portable electric drills and grinders manufactured by James Clark Jr., Electric Co., Louisville, Ky.

* * *

Word has been received to the effect the Ramsdell Specialty Co., Inc., Worcester, Mass., manufacturer of screw machine products, has been taken over by the Worcester Electric Specialty Co., Worcester, Mass.

M·A HANNA & Co

More Engineering than Selling

The responsibility for which the outside representatives of M. A. Hanna & Co. are schooled is definitely that of rendering sound and authoritative counsel on any matter pertaining to iron ore, pig iron or coal—each representative specializing on a single commodity. So long as this service is consistently maintained, the actual selling entails no great obstacles.

M. A. HANNA & CO.
CLEVELAND

SALES OFFICES

Chicago New York Pittsburgh Buffalo Cincinnati
Philadelphia Toledo Williamsport, Pa.
Detroit Toronto

HANNA

West of the Mississippi

BANNING, CAL.—The Southern Sierra Power Co. plans extensive power developments including two power houses.

LOS ANGELES—The Little Rock Creek Power & Water Co. plans two reservoirs in Little Creek, for generating power.

LOS ANGELES—The Santa Fe railroad is having plans prepared for a power house at San Bernardino, Cal., to cost $100,000.

CLARINDA, IOWA.—The Clarinda Mfg. Co. has been incorporated with $75,000 capital stock to manufacture washing machines, etc., by Edwin Lisle, William A. Turner and A. A. Cambre.

BATON ROUGE, LA.—The Wright Steam Motor Co., J. B. Wright, general manager, will erect a plant building, 100 x 150 feet.

BATON ROUGE, LA.—The H. O. Stace Iron Works, Inc., recently was incorporated with $25,000 capital stock.

NEW ORLEANS—The Algiers Dry Dock & Shipbuilding Co., Inc., has been incorporated with $100,000 capital stock.

ST. PAUL—Work has been started on erection of a warehouse for the Minnesota Mining & Mfg. Co. to cost $40,000.

SPRINGFIELD, MO.—The Springfield Gas & Electric Co. plans an addition to its power plant.

ST. LOUIS.—The Broderick & Bascom Rope Co. is reported planning a plant here at an estimated cost of $250,000.

ST. LOUIS—The Auto Pump Co. has been incorporated with $25,000 capital stock by Joseph E. McConnell, J. H. and A. H. Schreiber.

ARDMORE, OKLA.—R. H. Harris & Son plan a brick plant with a daily capacity of 20,000 brick.

MUSKOGEE, OKLA.—The Oklahoma General Power Co. plans a plant to have an initial capacity of 10,000 horsepower.

BEAUMONT, TEX.—The Pennsylvania Car Co., Farmers Bank building, Pittsburgh, is reported planning to establish a plant here.

DALLAS, TEX.—The Dallas Gas Co. plans a 1-story machine shop.

DALLAS, TEX.—The Columbia Fence & Wire Co. has been incorporated with $25,000 capital stock, by B. J. Ryan, D. B. Fielder and S. J. Smith.

ELECTRA TEX.—The U. S. Machine Shop has been incorporated with $30,000 capital stock by O. M. Stridham, Edward Campbell and J. M. Hemby.

SAN ANTONIO, TEX.—The Deems Tractor Hitch Co. has been incorporated with $31,000 capital stock by T. F. Roberts, Ezra Reust and C. O. Deems.

Business in Canada

YARMOUTH, N. S.—The Yarmouth Light & Power Co. plans a hydroelectric plant.

MONTROSE, ONT.—The Canadian Aloxide Co. plans a machine shop addition and has let the contract to the Robertson Construction Co., Niagara Falls, Ont.

OTTAWA, ONT.—The Radiola Co. of Canada, Ltd., has been incorporated to manufacture radio apparatus, etc., with $100,000 cpital stock by D'Arcy Scott, Allan J. Frazer and William L. Scott.

PORT COLBORNE, ONT.—The Port Colborne Foundry Co., Ltd., has been incorporated with $40,000 capital stock by Andrew D. Cross, David Alair and William H. Anderson.

SHAWINIGAN FALLS, ONT.—The Belgian Industrial Co., Ltd., is erecting a machine room.

ST. CATHARINES, ONT.—The Crysler Machine Works, Ltd., has been incorporated with $40,000 capital stock to manufacture and deal in machinery, tools, motors, automobiles, accessories, etc., by Philip I. Price, James H. Neelon, Charles W. Inksater, and others.

TORONTO, ONT.—The Ford Motor Co. of Canada, Ltd., is reported planning to establish a plant here.

TORONTO, ONT.—Engineering & Radio Supplies, Ltd., has been incorporated with $100,000 capital stock to manufacture and deal in electrical appliances, radio equipment, machinery, etc., by James G. Smith, Gordon A. Douglas, Edward J. Hopkins, and others.

MONTREAL, QUE.—I. & R. Benoit, 2163 Clare street, plans a garage at an estimated cost of $75,000 and is interested in equipment prices.

MONTREAL, QUE.—The Domestic Accessories Co., Ltd., has been incorporated to manufacture sanitary apparatus, etc., with $100,000 capital stock by Joseph A. Coulombe, Louis A. Coulombe and Francis Paul.

MONTREAL, QUE.—The Monarch Wire Products, Ltd., has been incorporated with $80,000 capital stock by Edward S. McDougall, David P. Gillmore and Robertson Fleet.

MONTREAL, QUE.—The Empire Brass Foundry, 128 Wellington street, plans a plant addition and will install new equipment. W. H. Madigan, 939 Atwater street, has the general contract.

New Trade Publications

PIPE FITTINGS—The American Spiral Pipe Works, Chicago, is circulating a large illustrated folder in which pipe fittings and ingenious special connections for spiral, riveted and lap-welded steel pipe are described. Blue prints of the various fittings are given.

SPECIFICATION HANDBOOK—The Truscon Laboratories, Detroit, has just issued its new specification handbook, which is of 108 pages, 8½ x 11 inches. The binding is looseleaf making the specifications adaptable for use as a reference book, etc. Complete specifications on waterproofings, damp proofings and technical coatings are given.

AUTOMATIC MACHINERY—The Baird Machine Co., Bridgeport, Conn., is circulating a small pamphlet in which it calls attention to the use of automatic machines in the manufacture of various products including hairpins, piano hardware, metal buttons, safety pins, etc. In addition several pages of the booklet are devoted to comments on things in general.

RESISTANCE THERMOMETER — The Brown Instrument Co., Philadelphia, has published a catalog in which resistance thermometers are described and illustrated. These operate upon the basis of electrical resistance rather than pressure and they are accurate and rapid. It is claimed that for installation where extreme accuracy is required within a small range of temperature, these thermometers are ideal.

STORAGE TANKS—The Conveyors Corp. of America, Chicago, has published a booklet describing a cast iron storage tank, which is designed for holding loose, bulky, dry materials for storage or transfer. The tank is sectional and may be secured in a number of sizes. The booklet is illustrated showing the tanks in use. Diagrams give details of construction and a comprehensive table of weights and measures is included.

RAILROAD EQUIPMENT—The Whiting Corp., Harvey, Ill., has just published a 48-page illustrated booklet in which railroad shop equipment is described and illustrated. This includes locomotive hoists, coach hoists, cranes, transfer tables, turntable tractors and car wheel foundries. Included in the illustrations is a line drawing showing a typical railroad shop layout. The information should be of value and interest to railroad men, and others interested in such equipment.

CRANES—The Industrial Works, Bay City, Mich., has just published an attractive 96-page illustrated catalog in which its various lines of cranes are described and illustrated. These include, locomotive, wrecking, wharf, gantry, transfer and pillar cranes, combination crane pile drivers, rail saws, grab buckets, transfer tables and steam pile hammers. The data given are interesting and the illustrations show the various equipment in actual operation. The last few pages of the book contain a small description of the company's plant.

HARDENING FURNACES—Tate-Jones & Co., Inc., Pittsburgh, is circulating a 4-page illustrated folder in which general hardening furnaces are described and illustrated. These are of the semi-muffle type, either for oil or gas fuel. These furnaces are designed to harden and anneal both high speed and carbon steels. The furnaces are fired by one burner. Sight hole and suitable pyrometer openings are provided. All that is required for operation, according to the booklet, is a small amount of compressed air at from 15 to 100 pounds pressure. This is piped to the furnace by a rubber hose attached to the upper compartment of the tank. There the air pressure is reduced, part of the air going to the burner for atomization and part to the lower compartment for pressure upon oil.

MALLEABLE IRON—The American Malleable Castings association, Cleveland, is circulating a 32-page illustrated booklet entitled "Certified Malleable in Transportation and Industry." The booklet contains an interesting story of malleable castings, made according to the exacting requirements of the American Malleable Castings association and their contribution to safety, strength, and economy in all branches of transportation and industry. The booklet not only points out the great responsibility that malleable castings assume when used for vital parts of automotive, railway, farm implement and general industrial construction, but also outlines the means employed by the association in bringing the product of its members to a uniformly high standard. The booklet is a complete treatise on malleable iron.

NUMERO 1415 TRENTE-ET-UNIÈME ANNEE 29 AVRIL 1922

REVUE INDUSTRIELLE
DE L'EST

Journal Métallurgique, Industriel, Economique et Financier

INSERTIONS
ON TRAITE A FORFAIT
Réductions pour annonces répétées
Annonces légales et judiciaires

DIRECTION & ADMINISTRATION
SOCIÉTÉ INDUSTRIELLE DE L'EST
Reconnue d'Utilité Publique
Téléph. 5-87 40, Rue Gambetta -:- NANCY Téléph. 5-87

ABONNEMENTS
France 1 an.... 40 fr. | Etranger, 1 an... 45 fr.
— 6 mois.. 22 fr. | — 6 mois.. 25 fr.
La numéro..... 1 fr. 00
Joindre 0 fr. 50 à chaque changement d'adresse

Revue Industrielle is the leading business and financial newspaper in the east of France, especially important in the iron and steel trade, as it is published in the Lorraine steel district.

États-Unis. — Un câblogramme en date du 30 avril émanant des services de la « Iron Trade Review », Cleveland, Ohio, des Etats-Unis, signale :

« Marché agité par menace de pénurie de coke causée par cessation de travail de nombreux ouvriers mineurs non syndiqués, dans la région de Connellsville, bien que la situation soit un peu meilleure. Quelques nouveaux hauts fourneaux arrêtés, mais la production en général continue. Augmentation de 1 à 3 dollars dans le prix de la fonte au cours de la semaine, fonte Pennsylvanie Est 23 à 24 dollars la t.; fonte Buffalo, 22 dollars, fonte Birmingham, 16 dollars 50. Demande considérable pour fer et acier, les prix se raffermissent. Des usines indépendantes augmentent les prix des billes, profilés et fers marchands de 2 dollars, comptant 32 dollars rendu Pittsburg. Peu d'offres en lingots. Grande activité en produits finis. La Mandchourie aurait commandé 7.000 tonnes de rails en Allemagne, craignant que les délais de livraison en Amérique ne fussent trop longs. La production actuelle en Ecosse atteint maximum depuis deux ans.

400 Newspapers Regularly Quote

THE IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—
THE IRON TRADE REVIEW
"The Most Widely Quoted Trade Paper In The World"

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	281,700	92,700	58,000
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	289,900	67,400	81,700
July	10,200	202,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	79,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921.....	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	**300,100**	**318,000**	**90,300**	**95,200**
March	**389,800**	**370,000**	.....	**130,900**
April	394,000	383,200	.....	.....
May	407,200	.....	.....	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	5,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921.....	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	366,900	.....	99,200
April	404,000	324,300	.....	.....
May	462,300	.....	.....	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
1921				
January	157,800	44,200	} 120,100	} 125,000*
February	153,400	35,400		
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	} 95,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	} 136,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	163,000	54,300
December	117,000	.....		56,300
Total for 1921.....	1,646,000	.....	514,200	596,400*
1922				
January	88,700	.....	.....	68,200
February	64,600	.....	.....	66,900
March	63,800	.....	.....	105,800
April	59,000	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	271,100	74,600	74,300	143,600
1921				
January	232,400	89,300	} 294,000	} 503,600*
February	166,900	125,800		
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	} 241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	} 192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	} 176,000	230,600
December	205,300	.....		212,900
Total for 1921.....	1,700,400	903,600	.....	2,110,000*
1922				
January	253,300	.....	.....	218,200
February	223,400	.....	.....	170,000
March	295,800	.....	.....	208,100
April	258,000	.....	.....	.....

*Provisional estimate owing to absence of German figures for first four months of 1921.

Export and import figures do not include scrap except in the case of Germany.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
May	17,292	229,616
April	15,884	197,562
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	43,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,579
Total	327,490	4,405,281
1918		
December	28,996	356,641
November	11,582	471,427
October	15,744	426,767
September	8,440	473,688
August	12,520	512,104
July	11,511	452,759
June	13,913	418,605
May	14,387	488,515
April	11,371	462,887
March	14,345	379,924
February	12,941	438,848
January	12,475	490,259
Total	168,223	5,372,424
1917		
December	14,642	653,344
November	13,995	473,549
October	14,310	571,868
September	19,058	499,067
August	26,129	503,075
July	28,859	346,393
June	29,080	629,305
May	26,479	582,303
April	48,213	519,397
March	37,943	606,559
February	24,947	449,099
January	40,910	608,281
Total	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Heat for Next Winter

If you have had trouble keeping your plant or factory warm, you should learn now about Skinner Bros. (Baetz Patent) Heaters. They maintain a uniform, comfortable, working temperature even in coldest weather—regardless of exposure or building construction.

The Skinner Bros. (Baetz Patent) Heater uses no external pipes or ducts—your building interior is unobstructed and you save the cost of the usual extra heating fittings. It is a single enclosed unit built in two types—type DF (shown above) burns coal, coke, wood, oil or gas—type SC (below at the left) derives its heat from exhaust or live steam at any pressure.

Baetz Type S. C.

A series of steam coils is mounted over a powerful fan wheel—air is drawn into the heater, warmed and then diffused throughout the open building area. Uses live or exhaust steam, at any pressure.

Pioneers In The Field

The Skinner Bros. (Baetz Patent) Heater is the pioneer in the field of ductless heating and embodies exclusive features and developments. Its remarkable performance is being demonstrated in many of the foremost industrial plants in the country.

The Skinner Bros. (Baetz Patent) Heater may be operated as a ventilator at the same time it is being used as a heater, or as a ventilator alone—useful in summer and in winter..

Read This Guarantee

Should the Skinner Bros. (Baetz Patent) Heater, when installed as directed by our engineers, fail to accomplish the results we specify, it becomes immediately returnable at our expense, and full purchase price will be refunded.

Find out now about the Skinner Bros. System—tell us about conditions in your factory and we will supply full details covering your particular case. No obligation whatever.

SKINNER BROS. MFG. CO., Inc.

1452 So. Vandeventer Ave. St. Louis, Mo.

Factories: St. Louis, Mo., and Elizabeth, N. J.

Boston, 475 Little Bldg.
Buffalo, 732 Morgan Bldg.
Chicago, 1733 Fisher Bldg.
Cincinnati, Ohio.
Cleveland, 642 Marshall Bldg.
Detroit, 338 Scherer Bldg.
Kansas City, 357 Lee Bldg.
New York, 1732 Flatiron Bldg.
Pittsburgh, 38 Wood St.
San Francisco, Monadnock Block
Spokane, 439 First Ave.
Washington, D. C., 744 Evans Bldg.

Skinner Bros.

Baetz Patent HEATING SYSTEM

Iron and Steel Production

Compiled By THE IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	Output— Total	Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,680,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,918	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,324	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,516	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	435	69	954,901	30,802
September	435	84	985,795	32,857
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,545,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,034,784	65,638
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495

Lake Ore Shipments

Gross Tons, Rail and Water

1921	22,799,077
1920	60,411,572
1919	48,546,651
1918	62,836,172
1917	64,437,003
1916	66,658,466
1915	47,272,751
1914	32,729,726
1913	49,947,116
1912	48,221,546
1911	32,793,130
1910	43,435,171

Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1910	25,154,087	940,832	26,094,919
1911	23,029,479	646,627	23,676,106
1912	30,284,682	966,621	31,251,303
1913	30,280,130	1,020,744	31,300,874
1914	22,819,784	693,246	23,513,030
1915	31,284,212	866,824	32,151,036
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,281,542	42,132,934
1921	19,184,084	559,713	19,743,797

Monthly Ingot Output

Gross Tons

1922	87.48 per cent of capacity	Indicated total
January	1,593,482	1,820,000
February	1,745,022	1,995,000
March	2,370,751	2,710,000
April	2,444,513	2,800,000
May	2,711,141	3,100,000

WHETHER it be the smallest auxilliary pipe fitting on a drainage or heating system, or an especially designed and constructed fitting for the transmission of acids or high pressure steam in an enormous power plant,

CRANE SERVICE

stands ready to fulfill the most exacting demands, and is conveniently located in more than one-hundred branches, offices and exhibit rooms in the leading cities throughout the country.

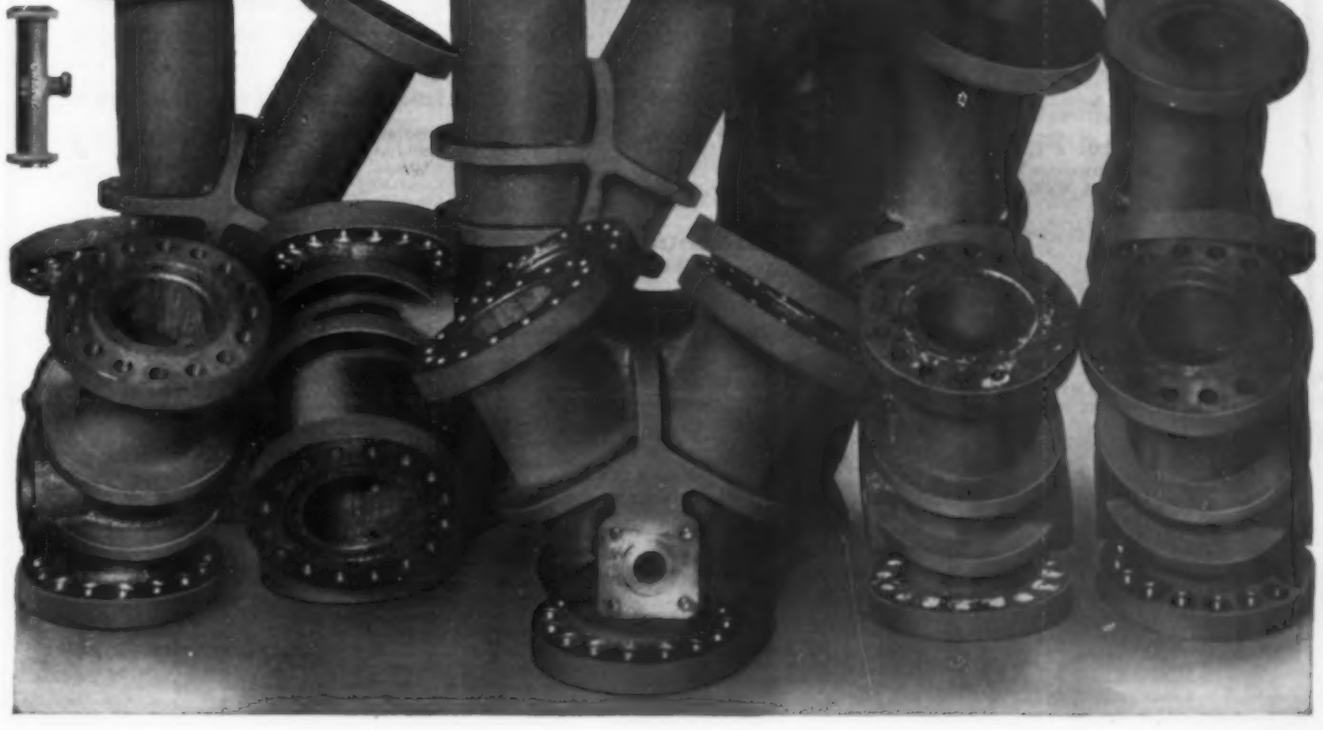
We are manufacturers of about 20,000 articles, including valves, pipe fittings and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes and are distributors through the trade of pipe, heating and plumbing materials.

1855——— **CRANE CO.** ———1922

836 South Michigan Avenue, Chicago

You are cordially invited when in Atlantic City to make the Crane Exhibit Rooms (1105-1107 Boardwalk) your headquarters. We will be glad to receive any mail addressed to you in our care.

Works:-
Chicago, Ill. and
Bridgeport, Conn.



Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron..$5.95
Mesabi Bessemer, 55 per cent iron..... 5.70
Old Range nonbessemer, 51½ per cent iron 5.20
Mesabi nonbessemer, 51½ per cent iron 5.05

PORT HENRY IRON ORE
Per Gross Ton, F.o.b., Port Henry

Old bed 21 furnace.....$4.50
Old bed concentrates, 63 per cent..... 5.25
Harmony, cobbed, 63 per cent..... 5.25
New bed, low phos., 65 per cent..... 7.50
Lump ore for fix..... 6.00

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 27 cents per unit.

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Caucasian, 48 to 50 per cent, c.i.f. Atlantic ports, nominal.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton.....$16.00 to 17.50

Rivets

Structural rivets 2.40c
Boiler rivets, Pittsburgh..... 2.50c
Rivets ⅞-in. and smaller, Pittsburgh .....70-5 to 70-10 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped .....$4.50 off list
Cold punched square or hexagon blank or tapped .....$4.50 off list
Cold punched semifinished hexagon nuts ½-inch and larger.....75-10 off
Cold punched semifinished hexagon nuts ⅜-inch and smaller.....80-10 off
Case hardened, finished, hexagon.....70 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
⅜ x 6 inches, smaller and shorter

Rolled thread .....60-10 off
Cut thread .....60 off
Larger and longer.....60 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60-10-10 off
Cut thread .....60-10-10 off
Larger and longer.....60-10-10 off
(⅜ x 4 inches, cold punched nuts)
Cut thread .....50-10 off
Larger and longer.....30-10 off
Lag screws .....60-10-10 off
Plow bolts Nos. 1, 2 and 3 heads .....50-10 + 20 off
Tap bolts .....30-10 off
Bolt ends with hot pressed nuts.....60-10 off
Blank bolts .....60-10 off
Rough stud bolts with nuts.....50-10 off

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

Butt Weld

	Black	Galvanized
⅛-inch	54½	28
¼ and ⅜-inch	60	33½
½-inch	65	50½
¾-inch	69	56½
1 to 3-inch	71	58½
Lap Weld		
2-inch	64	51½
2½ to 6-inch	68	55½
7 to 8-inch	65	51½
9 to 12-inch	64	50½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	69	56½
Lap Weld		
2-inch	62	49½
2½ to 6-inch	66	53½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	50½	33
¼ and ⅜-inch	56	38½
½-inch	62	50½
¾-inch	67	55½
1 to 1½-inch	69	57½
2 to 3-inch	70	58½
Lap Weld		
2-inch	62	50½
2½ to 4-inch	66	54½
4½ to 6-inch	65	53½
7 to 8-inch	61	47½
9 to 12-inch	55	41½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	51	40½
¾ to 1½-inch	54	43½
2 to 2½-inch	56	45½
Lap Weld		
2-inch	50	40½
2½ to 4-inch	52	42½
4½ to 6-inch	51	41½
7 to 8-inch	47	33½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
⅛ and ¼-inch	3½	+22½
⅜-inch	36½	18½
½-inch	42½	27½
¾ to 1½-inch	44½	29½
Lap Weld		
2-inch	39½	25½
2½ to 6-inch	42½	29½
7 to 12-inch	40½	27½
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
⅛ and ¼-inch	+ 4½	+37½
⅜-inch	35½	23½
½-inch	42½	28½
¾ to 1½-inch	44½	30½
Lap Weld		
2-inch	40½	27½
2½ to 4-inch	43½	31½
4½ to 6-inch	42½	30½
7 to 8-inch	35½	23½
9 to 12-inch	30½	18½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+27	+ 39
¾-inch	+ 7½	+19½
1-inch	+23½	+35½
1¼-inch	+ 7½	+19½
1½-inch	+ 6½	+18½
Lap Weld		
2 and 2½-inch	7½	14½
3 to 4-inch	12½	3½
4½ to 6-inch	11½	2½
8-inch	8½	

Boiler Tubes

L. C. L. discounts. C. L. 4-Point differential

STEEL	
1¾-inch	22½
2 and 2¼-inch	37
2½ to 3-inch	48
3¼ to 4-inch	53
IRON	
1½-inch	1
1¾-inch	11
2 and 2¼-inch	21
2½ to 3-inch	26
3¼ to 4½-inch	28
SEAMLESS	
1¼ to 1½-inch	51
1¾-inch	32
2-inch	38
2½ to 2¾-inch	42
3-inch	46
3¼ to 4-inch	51
4½ to 5-inch	43

Warehouse Prices

STEEL BARS	
Boston	2.605c
Buffalo	2.60c
Chicago	2.48c
Cincinnati	2.60c to 2.85c
Cleveland	2.41c
Detroit	2.58c
New York	2.58c
Philadelphia	2.56c
San Francisco	3.25c
Seattle	3.35c
St. Louis	2.575c
St. Paul	2.76c
Los Angeles	3.25c
IRON BARS	
Boston	2.605c
Buffalo	2.45c
Chicago	2.48c
Cincinnati	2.50c to 2.75c
Detroit	2.58c
New York	2.48c to 2.58c
Philadelphia	2.56c
St. Louis	2.575c
SHAPES	
Boston	2.705c
Buffalo	2.70c
Chicago	2.58c
Cincinnati	2.70c to 2.95c
Cleveland	2.51c
Detroit	2.68c
New York	2.68c
Philadelphia	2.66c
San Francisco	3.25c
Seattle	3.35c
St. Louis	2.675c
St. Paul	2.76c
Los Angeles	3.35c
PLATES	
Boston, ¼-inch	2.705c
⅛-inch	2.875c
Buffalo	2.70c
Chicago	2.58c
Cincinnati	2.70c to 2.95c
Cleveland	2.51c
Detroit	2.68c
New York	2.68c
Philadelphia	2.66c
San Francisco	3.25c
Seattle	3.35c
St. Louis	2.675c
St. Paul	2.86c
Los Angeles	3.50c
NO. 10 BLUE ANNEALED SHEETS	
Boston	3.75c
Buffalo	3.60c
Chicago	3.63c
Cincinnati	2.60c to 2.85c
Cleveland	3.25c to 3.46c
Detroit	3.58c
New York	3.63c
Philadelphia	3.40c
San Francisco	4.30c
Seattle	4.65c
St. Louis	2.725c
St. Paul	3.91c
Los Angeles	4.70c
NO. 28 BLACK SHEETS	
Boston	4.90c
Buffalo	4.45c
Chicago	4.45c
Cincinnati	2.85c
Cleveland	4.00c
Detroit	4.38c
New York	4.35c
Philadelphia	4.25c
San Francisco	5.80c
Seattle	5.65c
St. Louis	4.45c
St. Paul	4.73c
Los Angeles	5.80c
NO. 28 GALVANIZED SHEETS	
Boston	5.90c
Buffalo	5.45c
Chicago	5.45c
Cincinnati	5.20c
Cleveland	5.00c
Detroit	5.38c
New York	5.35c
Philadelphia	5.25c
San Francisco	6.65c
Seattle	6.65c
St. Louis	5.45c
Los Angeles	6.65c
BANDS	
Boston	3.15c
Buffalo	3.20c
Chicago	3.23c
Cincinnati	3.35c to 3.60c
Cleveland	3.06c
Detroit	3.33c
New York	2.98c to 3.13c
Philadelphia	3.21c
San Francisco	3.90c
Seattle	4.00c
Los Angeles	4.15c
HOOPS	
Boston	4.00c
Buffalo	3.35c
Cleveland	3.06c
Detroit	3.48c
New York	3.63c
Philadelphia	3.35c
Seattle	4.75c
COLD ROLLED SHAFTING	
Boston (rounds)	3.30c
Buffalo	3.40c
Chicago	3.40c
Cincinnati (rounds)	3.35c to 3.45c
Detroit (rounds)	3.35c
New York	3.35c
New York (flats, squares and hexagons)	3.85c
Philadelphia (rounds)	3.20c
San Francisco	4.65c
Seattle	5.00c
Los Angeles	5.10c
Boston, flats, squares and hexagons	3.90c

CAN THERE BE A BETTER METHOD OF LOADING?

IS it possible to load material mechanically on a principle superior to that built into the Link-Belt power-swiveling loader?

All of our experience—all of our engineering ability—all of our manufacturing skill—has been called upon to make this machine the "last word" in loader construction.

You must see this Link-Belt Loader at work to appreciate it. Briefly, here is how it operates—

Simply backs into the pile under its own power, cuts a complete semi-circle, digging and loading all the time. When the semi-circle is complete, it backs into the pile a little further, cuts another semi-circle (loading as fast as you can take care of the material) and repeats this operation until the job is done.

Simple, easy, effective—no "frills" or "attachments" to assist it—the principle is correct. It is built right—it works right. The entire Link-Belt organization stands behind it.

To be convinced, let us show you one of the Link-Belt Power Swiveling Loaders in operation.

LINK-BELT COMPANY 950

PHILADELPHIA

New York	Woolworth Bldg.
Boston 9	49 Federal St.
Pittsburgh	1501 Park Bldg.
St. Louis	Central National Bank Bldg.
Buffalo	547 Ellicott Square
Wilkes-Barre	2nd National Bank Bldg.
Huntington, W. Va.	Robson-Prichard Bldg.
	H. W. CALDWELL & SON CO.

CHICAGO

Cleveland	629 Kirby Bldg.
Detroit	4210 Woodward Ave.
Kansas City, Mo.	506 Elmhurst Bldg.
Seattle	823 First Ave., S.
Portland, Ore.	101 First St.
San Francisco	168 Second St.
Los Angeles	167 N. Los Angeles St.
CHICAGO, 17th and Western Ave.	NEW YORK, Woolworth Bldg.

INDIANAPOLIS

Denver	Lindsmith, Shubart & Co., Boston Bldg.
Louisville, Ky.	Frederick Wehle, Starks Bldg.
New Orleans	C. O. Hinz 604 Carondelet Bldg.
New Orleans	Whitney Supply Co. Ltd. 410 S. Peters St.
Birmingham, Ala.	S. L. Morrow, 720 Brown-Marx Bldg.
In Canada, Canadian Link-Belt Co., Ltd.	Toronto & Montreal
DALLAS, TEXAS, 709 Main St.	

LINK-BELT

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1922, Compiled by The Iron Trade Review

1922	
Average for June	$36.96
June 28	37.26
June 21	37.12
June 14	36.74
June 7	36.72
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	51.98
Average for year	40.74
1920	
December	54.04
November	63.75
October	$68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	50.32
1918	
December	57.24
November	55.67
October	57.53
September	$56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10
1916	
December	53.68
November	46.77
October	41.50
September	39.97
August	$39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year	24.76
1914	
December	21.58
November	23.39
October	$22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year	26.32

Iron and Steel Statistics

Tin Plate Production

Year	Tin plate Tons	Terne plate Tons	Total Tons
1908	524,448	77,090	601,538
1909	589,929	95,465	685,394
1910	725,411	84,092	809,503
1911	798,814	79,221	878,035
1912	982,830	95,698	1,078,528
1913	854,093	68,472	922,565
1914	969,892	73,098	1,042,990
1915	1,100,913	81,735	1,182,648
1916	1,276,113	107,088	1,383,201
1917	1,616,658	76,946	1,693,604
1918	1,608,124	42,689	1,650,813
1919	1,203,579	85,427	1,289,006
1920	1,539,977	69,112	1,609,089
1921	837,660	50,721	888,381

Sheet Production

Year	Tons
1913	1,921,001
1914	1,668,644
1915	2,106,298
1916	2,492,794
1917	2,595,606
1918	2,176,537
1919	2,316,057
1920	3,133,217
1921	1,713,288

Plate Production

Year	Sheared Tons	Universal Tons	Total Tons
1913	1,844,354	1,158,416	3,002,770
1914	1,346,308	766,133	2,112,441
1915	1,923,199	954,852	2,878,051
1916	2,453,150	1,224,234	3,677,384
1917	2,963,039	1,195,199	4,158,238
1918	3,885,126	1,234,782	5,119,908
1919	2,899,967	992,054	3,892,021
1920	3,505,364	1,249,769	4,755,133
1921	1,189,714	570,610	1,760,324

Shape Production

Year	Gross tons
1908	1,083,181
1909	2,275,562
1910	2,266,890
1911	1,912,367
1912	2,846,487
1913	3,004,972
1914	2,031,124
1915	2,437,003
1916	3,029,964
1917	3,110,000
1918	2,849,969
1919	2,614,036
1920	3,306,748
1921	1,272,624

Bar Production

Gross Tons

Year	Iron Tons	Steel Tons	Total Tons
1908	685,233	1,301,405	1,986,638
1909	952,230	2,311,301	3,263,531
1910	1,074,163	2,711,568	3,785,731
1911	835,625	2,211,737	3,047,362
1912	944,790	2,752,324	3,697,114
1913	1,026,632	2,930,977	3,957,609
1914	563,171	1,960,460	2,523,631
1915	657,107	3,474,135	4,131,242
1916	993,948	5,236,354	6,230,302
1917	983,926	5,226,031	6,209,957
1918	846,898	5,395,851	6,242,749
1919	446,549	3,945,075	4,391,624
1920	663,032	5,467,208	6,130,240
1921	198,324	1,367,430	1,565,754

Tube Production

	Iron	Steel	Total
1913	276,067	1,969,465	2,245,532
1914	212,147	1,525,557	1,737,704
1915	206,513	1,713,161	1,919,674
1916	278,117	2,372,941	2,651,058
1917	273,890	2,213,087	2,486,977
1918	202,958	2,087,521	2,290,479
1919	162,356	2,212,575	2,374,931
1920	199,673	2,803,052	3,002,725
1921	110,293	1,877,149	1,987,442

Steel Rail Production

Year	Tons
1908	1,920,944
1909	3,023,845
1910	3,635,801
1911	2,822,556
1912	3,327,915
1913	3,502,780
1914	1,945,095
1915	2,204,203
1916	2,854,518
1917	2,944,161
1918	2,540,892
1919	2,203,843
1920	2,604,116
1921	2,178,818

Iron and Steel Freight Rates

Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.76
Newark, N. J.	6.05
Boston	6.55
Philadelphia	5.67
Pittsburgh	1.76
Chicago	4.79
St. Louis	5.80
Minneapolis, St. Paul	6.84
Buffalo to:	
Albany, N. Y.	$2.27
New England (rail)	4.91
New York and Brooklyn (rail)	4.91
Philadelphia	4.91
Rochester	1.39
Virginia furnaces to:	
Philadelphia	$5.17
New England	5.92
Brooklyn, Jersey City, Newark	5.54
Birmingham, Ala., to:	
Boston	$9.60
Cincinnati	4.05
Chicago	6.00
Cleveland	6.00
Louisville, Ky.	3.71
Minneapolis, St. Paul	8.76
New York	9.24
Philadelphia	7.80
Pittsburgh	6.84
St. Louis	5.15
Chicago to:	
Des Moines	$4.15
Minneapolis, St. Paul	3.04
Milwaukee	0.75
Moline, Ill.	1.71
Omaha	5.47
St. Louis	2.52
Ironton and Jackson, O., to:	
Chicago	$4.79
Cincinnati	2.27
Cleveland	3.02
Detroit	3.28
Indianapolis	2.90
Minneapolis, St. Paul	7.56

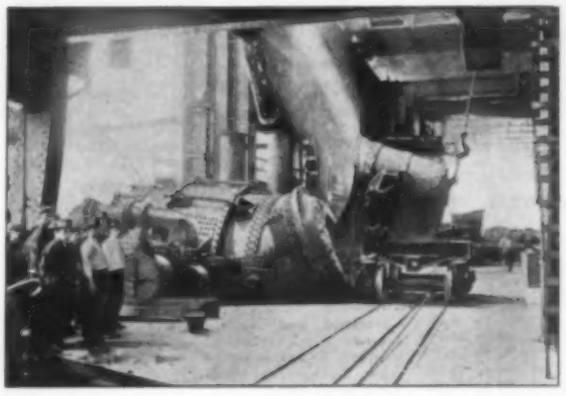
Finished Material

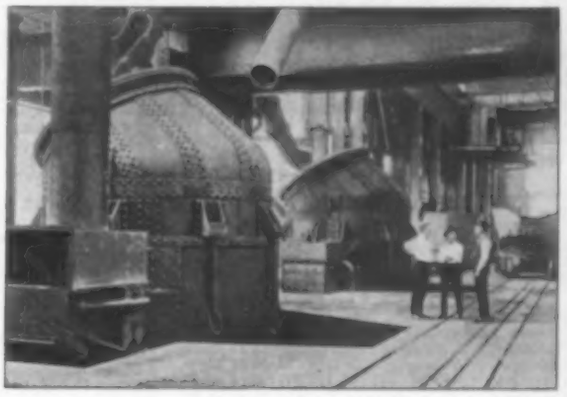
Pittsburgh, carloads, per 100 pounds, to:	
New York	$0.342
Philadelphia	0.324
Baltimore	0.315
Boston	0.364
Buffalo	0.265
Cleveland	0.216
Cincinnati	0.292
Chicago	0.342
Detroit	0.292
Minneapolis and St. Paul	0.598
Kansas City	0.733
Denver	1.188
St. Louis	0.427
New Orleans	0.463
Birmingham	0.688
Pacific coast (all rail)	1.498
Pacific coast (tin plate)	1.498

PENNSYLVANIA CONVERTERS

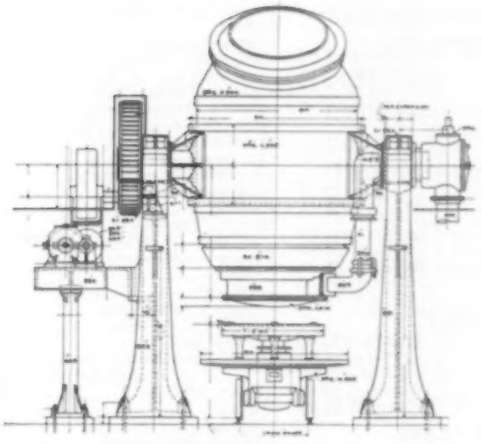
Converters for Duplex Steel Plants, 10 to 25 tons Hydraulic or Electric Operation
Converters for Bessemer Steel Plants, 6 to 15 tons Hydraulic or Electric Operation
Converters for Steel Foundries, 1 to 6 tons Electric Operation

Our many installations testify to our ability to design and install converters and auxiliary equipment, including blast piping with receivers and operating valves, Jack Cars, Slag Cars, Ladle Cars, Ladles, Jib Cranes, Scrap and Scale Chutes, Car Haulage Systems, Accumulators, Post Ladle Cranes, and Bottom House with Accessories.

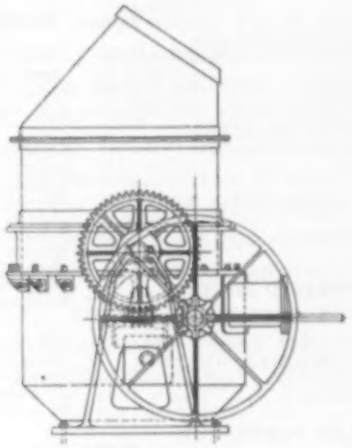




25-Ton Converters, Illinois Steel Co., South Chicago Works



Bottom Blown Converters



Surface Blown Converters

INSTALLATIONS AT

Bethlehem Steel Co., Steelton Works	3—25-ton	Tata Iron & Steel Co., India	2—25-ton
Bethlehem Steel Co., Saucon Works	3—25-ton	Algoma Steel Co., Canada	1—25-ton
Bethlehem Steel Co., Sparrow's Point Works	3—25-ton	Dominion Iron & Steel Co., Canada	3—15-ton
Steel & Tube Co. of America, Indiana Harbor	2—15-ton	American Steel & Wire Co., Donora	2—25-ton
Illinois Steel Co., South Works	2—25-ton	Tenn. C. I. & R. R. Co., Birmingham	3—25-ton
Illinois Steel Co., Gary Works	2—25-ton	Wisconsin Steel Co., South Chicago	2—10-ton
Jones & Laughlin Steel Co., Aliquippa Works	3—25-ton	Carnegie Steel Co., New Castle, Pa.	2—12-ton
Republic Iron & Steel Co., Youngstown, Ohio	2—15-ton	American Steel & Wire Co., Cleveland	2—15-ton

Large Converters in Stock for Prompt Shipment

Pennsylvania Engineering Works
New Castle, Pa.

Builders of Blast Furnaces and Steel Mill Equipment

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$13.50 to 14.50
Boston (dealers)	10.00 to 10.50
Buffalo	16.50 to 17.00
Chicago	15.00 to 15.50
Cincinnati	13.50 to 14.00
Cleveland	15.25 to 15.50
Detroit (dealers)	12.75 to 13.25
Eastern Pennsylvania	15.00 to 15.50
New York (dealers)	9.50 to 10.00
Pittsburgh	16.50 to 17.00
San Francisco	10.00
St. Louis	13.00 to 13.50
Valleys	17.50 to 17.75
No. 1 railroad steel New York (dealers)	11.00 to 11.50

BUNDLED SHEETS

Buffalo	$11.00 to 11.50
Cleveland (hydraulic)	12.75 to 13.25
Cincinnati	7.50 to 8.00
Eastern Pennsylvania	13.50 to 14.00
Pittsburgh	14.50 to 15.00
St. Louis	6.50 to 7.00
Valleys (hydraulic)	15.00 to 15.50

STEEL RAILS, SHORT

Birmingham	$14.50 to 15.50
Boston (dealers)	10.00 to 11.00
Chicago	17.00 to 17.50
Cincinnati	15.00 to 15.50
Cleveland	13.75 to 14.25
St. Louis	15.00 to 15.50

STOVE PLATE

Birmingham	$14.50 to 15.50
Boston (consumers)	13.00 to 13.50
Buffalo	15.00 to 15.50
Chicago	16.50 to 17.00
Cincinnati (net)	11.50 to 12.00
Cleveland	14.00 to 14.50
Detroit	11.50 to 12.00
Eastern Pennsylvania	14.50 to 15.00
New York	10.50 to 11.00
Pittsburgh	15.00 to 15.50
St. Louis	14.50 to 15.00

LOW PHOSPHORUS

Buffalo	$18.00 to 18.50
Cincinnati	18.00 to 18.50
Eastern Pennsylvania	19.00 to 21.00
Pitts. billet and bloom crops	21.00 to 21.50

SHOVELING STEEL

Chicago	$14.50 to 15.00
Pittsburgh	14.75 to 15.25
St. Louis	12.50 to 13.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$17.50 to 18.00
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	18.00 to 18.50
St. Louis	17.00 to 17.50

COMPRESSED SHEETS

Buffalo	$14.25 to 14.75
Chicago	12.50 to 13.00
Pittsburgh	15.25 to 15.75

FROGS, SWITCHES, GUARDS

Chicago	$15.00 to 15.50
Eastern Pennsylvania	15.00 to 15.50
St. Louis	14.00 to 14.50

BOILER PLATE, CUT

Detroit (dealers)	$8.00
St. Louis (dealers)	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	$16.00 to 16.50
St. Louis	14.50 to 15.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$12.50 to 14.00
Boston (dealers)	11.00 to 12.00
Buffalo	15.00 to 16.00
Chicago, No. 1	14.75 to 15.25
Chicago, No. 2	15.00 to 15.50
Cincinnati, No. 1	13.00 to 13.50
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	18.00 to 18.50
Pittsburgh, No. 1	15.00 to 15.50
Pittsburgh, No. 2	17.00 to 17.50
New York, No. 1 (dealers)	13.50 to 14.00
St. Louis, No. 1	14.50 to 15.00
St. Louis, No. 2	13.50 to 14.00

WROUGHT PIPE

Boston (dealers)	$7.50 to 8.00
Buffalo	12.00 to 12.50
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	9.25 to 9.50

YARD WROUGHT

Boston	$9.00 to 10.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

CITY WROUGHT

New York, long	$10.75 to 11.25

BUSHELING

Buffalo, No. 1	15.00 to 15.50
Chicago, No. 1	13.00 to 13.50
Chicago, No. 2	7.50 to 8.00
Cincinnati, No. 1	11.00 to 11.50
Cleveland, No. 1	11.00 to 11.25
Cleveland, No. 2	9.00 to 9.50
Eastern Pennsylvania, No. 1	14.50 to 15.00
Pittsburgh, No. 1	13.50 to 14.00
St. Louis, No. 1	12.00 to 12.50
Detroit, No. 1	10.50 to 11.00

MACHINE SHOP TURNINGS

Birmingham	$6.00 to 6.50
Boston (dealers)	8.50 to 9.00
Buffalo	11.00 to 12.00
Chicago	9.00 to 9.50
Cincinnati (net)	7.50 to 8.00
Cleveland	11.50 to 11.75
Detroit (dealers)	8.75 to 9.25
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	9.50 to 10.00
Pittsburgh	13.50 to 14.00
St. Louis	9.00 to 9.50
Valleys	12.00 to 12.50

CAST IRON BORINGS

Birmingham (chemical)	$13.40 to 14.00
Birmingham, borings (plain)	6.00 to 7.00
Boston (chemical)	10.50 to 11.00
Boston (dealers)	8.50 to 9.00
Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Cincinnati (net)	8.00 to 8.50
Cleveland	12.25 to 12.75
Detroit (dealers)	10.75 to 11.25
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania (chemical)	16.00 to 17.00
Pittsburgh	15.50 to 16.00
New York (dealers' price)	9.50 to 10.00
St. Louis	9.50 to 10.00
Valleys	14.25 to 14.75

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$8.50 to 9.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	9.50 to 10.00

IRON AXLES

Birmingham	$14.50 to 15.50
Boston	$20.00 to 21.00
Buffalo	23.00
Chicago	25.00 to 25.50
Cincinnati	19.50 to 20.00
Detroit	20.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	20.00 to 21.50
Pittsburgh	24.00 to 25.00
St. Louis	25.50 to 26.00

IRON RAILS

Buffalo	$16.00 to 17.00
Chicago	17.50 to 18.00
Cincinnati	13.50 to 14.00
Cleveland	14.00 to 14.50
St. Louis	16.00 to 16.50

PIPES AND FLUES

Chicago	$11.00 to 11.50
Cincinnati	7.00 to 7.50
Cleveland	11.00 to 11.50
St. Louis	8.50 to 9.00

RAILROAD GRATE BARS

Buffalo	$14.00 to 14.50
Chicago	15.00 to 15.50
Cleveland	14.00 to 14.50
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	10.00 to 10.50
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	$8.00 to 8.50
Chicago, small	10.25 to 10.75
Cleveland, small	11.25 to 11.75
Cleveland, large	11.25 to 11.75
Detroit (dealers)	9.50 to 10.00

FORGE SCRAP

Boston	$7.75 to 8.25
Chicago	15.00 to 15.50
Eastern Pennsylvania, No. 1	13.00 to 13.50

ARCH BARS AND TRANSOMS

Chicago	20.00 to 21.00
St. Louis	20.50 to 21.00

ANGLE BARS—IRON

Chicago	$19.50 to 20.00
St. Louis	18.00 to 18.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$8.50 to 9.00
Buffalo	15.00 to 15.50
Chicago	12.00 to 12.50
Cleveland	12.75 to 13.00
Detroit	11.50 to 12.00
Eastern Pennsylvania	13.00 to 14.00
Pittsburgh	15.50 to 16.00
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	$14.50 to 15.50
Boston (dealers)	15.50 to 16.00
Buffalo	18.00 to 19.00
Chicago	17.00 to 17.50
Cleveland	17.00 to 17.25
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	15.00 to 18.00
Pittsburgh	16.00 to 16.50
St. Louis	18.50 to 19.00

SHAFTING

Boston (dealers)	$15.00 to 16.00
Chicago	20.00 to 20.50
Eastern Pennsylvania	19.50 to 20.00
New York (dealers)	15.00 to 16.00
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$13.00 to 15.00
Birmingham, tram car	14.00 to 15.00
Boston (consumers)	18.00 to 18.50
Buffalo, iron	17.50 to 18.00
Chicago, iron	18.50 to 19.00
Cincinnati	14.50 to 15.00
Cleveland, iron	13.00 to 13.50
Detroit	14.50
Eastern Pennsylvania, iron	18.50 to 19.00
New York, iron (dealers)	14.00 to 15.00
Pittsburgh, iron	19.50 to 20.00
Pittsburgh, steel	18.00 to 18.50
St. Louis, iron	18.50 to 19.00

NO. 1 CAST SCRAP

Birmingham, cupola	$14.50 to 15.50
Boston (consumers)	18.50 to 19.00
Buffalo	17.00 to 17.50
Chicago, cupola	17.50 to 18.00
Cincinnati, No. 1, machinery, cupola (net)	15.50 to 16.00
Cleveland, cupola	17.00 to 17.50
Eastern Pennsylvania, cupola	18.00 to 19.00
New York, cupola (dealers)	15.00 to 15.50
Pittsburgh, cupola	19.50 to 20.00
San Francisco	23.00 to 24.00
St. Louis, agricultural	18.00 to 18.50
St. Louis, railroad	17.75 to 18.25
Valleys	18.00 to 18.50
Detroit, machinery (net)	15.50 to 16.00

HEAVY CAST

Boston (consumers)	$17.00 to 18.00
Buffalo	16.00 to 16.50
Cleveland	14.75 to 15.00
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.50 to 14.00
Pittsburgh	18.00 to 18.50
Detroit, automobile (net)	19.00 to 19.50

MALLEABLE

Boston (railroad)	$14.00 to 15.00
Buffalo	17.00 to 17.50
Chicago, railroad	17.50 to 18.00
Chicago, agricultural	17.50 to 18.00
Cincinnati, agricultural	12.00 to 12.50
Cincinnati, railroad	12.00 to 12.50
Cleveland, agricultural	12.50 to 13.00
Cleveland, railroad	15.25 to 15.50
Detroit	14.00
Eastern Pennsylvania, railroad	13.00 to 14.00
Pittsburgh, railroad	16.00 to 16.50
Pittsburgh, agricultural	13.00 to 13.50
St. Louis, agricultural	13.50 to 14.00
St. Louis, railroad	13.50 to 14.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Birmingham	$15.00 to 16.00
Boston (dealers)	11.50 to 12.00
Chicago	15.75 to 16.25
Cleveland	16.00 to 16.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.50 to 14.50
Pittsburgh district	17.50 to 18.00
St. Louis	14.50 to 15.00

LOCOMOTIVE TIRES

Chicago	$12.75 to 13.25
St. Louis	12.50 to 13.00

LOW PHOSPHORUS PUNCHINGS

Chicago	$17.00 to 17.50
Eastern Pennsylvania	19.00 to 21.00
Pittsburgh	18.00 to 18.50

Tire Carrier
This was formerly a Casting

A Few Reasons Why
Pressed Steel Parts
are Superior to castings

Read over these reasons *carefully*. Any one of them would make it well worth your while to substitute Parish and Bingham Pressed Steel Parts for the castings that you are using.

Parish and Bingham Pressed Steel Parts are *stronger* than castings—and they are *tougher* than castings; therefore their *reliability* is greater and if you use them in your products your reputation is made secure.

Parish and Bingham Pressed Steel Parts are *lighter* than castings and are *less brittle*—advantages that certainly should not be underestimated.

Parish and Bingham Pressed Steel Parts are absolutely *uniform* in shape and weight—which means they are interchangeable without alteration, under all conditions.

Parish and Bingham Pressed Steel Parts are produced much more rapidly and at a much lower cost than castings for the same purpose could be produced. Then, since all of the above points are facts that have been demonstrated time and time again, do you not believe it would be time well invested to check up on all the castings that you are now using and see how many of them could be superseded by our stampings?

In doing this we will gladly offer you the services of our corps of Engineers—men whose services have proved valuable to many others. Just drop us a line.

Gasoline Tank Support
Formerly made from Malleable Casting or Drop Forging

Parish & Bingham Corporation

Builders of Automobile Frames and Steel Stampings

CLEVELAND, OHIO

Motor Support
Formerly a Casting

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶Index to advertisements will give you page number of any advertiser and by referring to advertisement you can get full particulars about products.

ACCUMULATORS
Birdsboro Steel Fdy. & Mach. Co., Birdsboro, Pa.
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

ACETYLENE CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
Linde Air Products Co., 30 E. 42nd St., New York City.
Oxweld Acetylene Co., Newark, N. J.
Prest-O-Lite Co., Inc., 30 E. 42nd St., New York City.

ADAMITE ROLLS
Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa.

ADDRESSERS (Metal Shipping Tags)
Pannier Bros. Stamp Co., 210 Sandusky St., Pittsburgh, Pa.

AGITATORS
Hammond Iron Works, Warren, Pa.

AGRICULTURAL SHAPES
Pollak Steel Co., The, Cincinnati, O.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS
Central Steel Co., The, Massillon, Ohio.
Hickman, Williams & Co., 1343 Oliver Bldg., Pittsburgh, Pa.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Ferro Alloy Corp., 34 East 42nd St., New York, N. Y.
Vanadium Corp. of America, Equitable Bldg., New York.

ALUMINUM
Phillips, F. R., & Sons Co., Pennsylvania Bldg., Philadelphia, Pa.
Rogers, Brown & Co., Room 1942—30 Church St., New York, N.Y.

ALUMINUM (Vanadium)
Vanadium Corp. of America, Equitable Bldg., New York.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.
Pittsburgh Annealing Box Co., May Bldg., Pittsburgh, Pa.
Pittsburgh Malleable Iron Co., Pittsburgh.
Riter-Conley Co., Oliver Bldg., Pittsburgh.
Smith, George H., Steel Casting Co., Milwaukee.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
Wilfong, Millard F., Iron Works Co., Philadelphia, Pa.
Zanesville Malleable Iron Co., Zanesville, O.

APPRAISING
Metzler, Robt. J., Inc., 15 Mechanic St., Newark, N. J.
Smith & Jaffe, 68 West 45th St., New York, N. Y.

ARMOR FOR CONCRETE FLOORS
Irving Iron Works, Long Island City, N.Y.

ASBESTOS CLOTHING
Holcomb Safety Garment Co., The, 14 So. Jefferson St., Chicago, Ill.

AUCTIONEERS
Smith & Jaffe, 68 West 45th St., New York, N. Y.

AXLES
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pollak Steel Co., The, Cincinnati, O.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

BALING PRESSES
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

BALLS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Forged Steel)
Akron-Selle Co., Akron, O.

BANDS (Iron)
Lockhart Iron & Steel Co., Pittsburgh, Pa.

BANDS (Steel)
Pollak Steel Co., The, Cincinnati, Ohio.

BANKERS (Investment)
DeWolf & Co., Inc., Cor. Monroe and Dearborn Sts., Chicago.

BAR BENDERS
Kardong Bros., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York, N. Y.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.

BARS (Angle)
Buffalo Steel Co., Tonawanda, N. Y.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Steel Co., Tonawanda, N. Y.
Franklin Steel Works, Franklin, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Pacific Coast Steel Co., San Francisco, Cal.
Pollak Steel Co., The, Cincinnati, O.
Ryerson, Jos. T., & Son, 16th and Rockwell Sts., Chicago, Ill.
Truscon Steel Co., 250 Lafayette Blvd., Detroit, Mich.

BARS (Iron)
Cincinnati Iron & Steel Co., Cincinnati, O.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Steel Co., Tonawanda, N. Y.
Bliss & Laughlin, Inc., Harvey, Ill.
Cambria Steel Co., Philadelphia, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., 475 Abbott Road, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., Chicago, Ill.
Illinois Steel Co., Warehouse Dept., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Pacific Coast Steel Co., San Francisco, Cal.
Pardee Steel Corp., Perth Amboy, N. J.
Pollak Steel Co., The, Cincinnati, O.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Joseph T., & Son, Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Oliver Bldg., Pittsburgh, Pa.
Pacific Coast Steel Co., San Francisco, Cal.
Phillips, F. R., & Sons Co., Pennsylvania Bldg., Philadelphia, Pa.
Pollak Steel Co., The, Cincinnati, Ohio.
Ryerson, Jos. T., & Son, 16th and Rockwell Sts., Chicago, Ill.
Snead Architectural Iron Works, Louisville, Ky.

BEARINGS AND BUSHINGS (Bronze)
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
General Bronze Foundry Co., The, 1275 East 54th St., Cleveland, O.
Shoop Bronze Co., The, 344 West Sixth St., Tarentum, Pa.

BEARINGS (Journal)
Keystone Bronze Co., 39th St., Pittsburgh, Pa.

BEARINGS (Roller)
Hyatt Roller Bearing Co., Industrial Bearing Division, 6th Ave. at 41st St., N. Y. City.

BELT CEMENT AND DRESSING
Williams, I. B., & Sons, Dover, N. H.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago.
Williams, I. B., & Sons, Dover, N. H.

BELTING (Leather)
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago.
Williams, I. B., & Sons, Dover, N. H.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., Cleveland.
Hinman, D. A., & Co., Sandwich, Ill.
Long & Allstatter Co., Hamilton, O.
Niles-Bement-Pond Co., 111 Broadway, N. Y.
Simmons Machine Co., Inc., Albany, N. Y.
Sutton-Abramsen Engrg. Co., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Co., The, Pittsburgh, Pa.

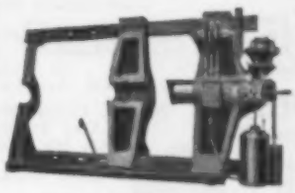
BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O
Andrew Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel Co., The, Massillon, Ohio.
Donner Steel Co., Inc., 475 Abbott Road, Buffalo, N. Y.
Illinois Steel Co., Chicago, Ill.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

THE VAUGHN MACHINERY Co.

ROD MILLS
DRAW BENCHES
WIRE DRAWING AND
HANDLING EQUIPMENT
for Steel, Copper and Alloys

CUYAHOGA FALLS, OHIO



HYDR. WHEEL PRESS

HYDRAULIC MACHINERY
Of Every Description.

Hydraulic High Pressure Valves for any make of Hydraulic Presses.

FOR AUTOMATIC GAS PRODUCERS
See our advertisement in last week's issue.

R. D. WOOD & CO.
PHILADELPHIA, PA.

THE LONG AND ALLSTATTER CO.
POWER PUNCHING & SHEARING MACHINERY
AMERICAN PUNCH & SHEAR WORKS — THE QUALITY LINE
HAMILTON, OHIO, U.S.A.

ENGINE BUILDERS
SINCE 1833
Corliss Engines 50 to 10,000 H. P.
Gas Engines 100 to 3000 H.P.

The C&G COOPER CO.
MT. VERNON, OHIO
50 Church St., New York: Oliver Bldg., Pittsburgh
626 Great Southern Life Bldg., Dallas, Texas
Since 1833 Engineers and Builders

MORTON
72 Inch Stroke Travelling Head
PLANER

Adaptable for either draw or push cut, and equipped with a wide range of milling and boring feeds and adjustments. ¶ Takes less space than housed planers, and uses less power. ¶ May we send Bulletin No. 8 H? It contains full details.

Morton Mfg. Company
Muskegon Heights Mich.

96 inch vertical, 12 feet horizontal feed, standard Planer head on ram.

Thomas Spacing Machine Co.
FULTON BUILDING
Pittsburgh, Pa.

THOMAS SPACING TABLES
Eastern Sales Office:
714 Commercial Trust Bldg., Philadelphia, Pa.

THOMAS MULTIPLE PUNCHES
Western Sales Office:
1243 Monadnock Block, Chicago, Ill.

SUTTON - ABRAMSEN
STRAIGHTENING MACHINES
THE BEST IN THE WORLD
Sutton-Abramsen Engineering Co.
Park Bldg. PITTSBURGH, PA., U. S. A.

BOLT, NUT, FORGING and WIRE NAIL MACHINERY
"National" Wedge Grip Bolt and Rivet Headers, National Bolt Cutters, National Heavy-Pattern Forging Machines, Etc.
We solicit your inquiries
THE NATIONAL MACHINERY COMPANY
TIFFIN, OHIO, U. S. A.

Your Scrap Metal
Worth Most in Dense Bundles

To avoid loss by oxidization, get larger charges into the furnace and need less heat for melting, mills prefer the compact bundles made by our

Hydraulic Scrap Bundling Presses

Write for Particulars

Logemann Brothers Company
3126 Burleigh Street Milwaukee, Wisconsin

BILLETS AND BLOOMS (Continued)
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Pardee Steel Corp., Perth Amboy, N. J.
Phillips, F. R., & Sons Co., Pennsylvania Bldg., Philadelphia, Pa.
Steel & Tube Co. of America, 111 W. Washington St., Chicago, Ill.
Wheeling Steel Products Co., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.

BLAST FURNACES
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

BLOWERS
Buckeye Blower Co., Columbus, O.
Connersville Blower Co., The, Connersville, Ind.
Ingersoll-Rand Co., 11 Broadway, New York.
Roots, P. H. & F. M., Co., Connersville, Ind.

BOILERS AND SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Davis, J. F., Chicago, Ill.
Erie City Iron Works, Erie, Pa.

BOILERS (Waste Heat)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS (Water Tube)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILER TUBES
Cincinnati Iron & Steel Co., The, Cincinnati, O.
Detroit Seamless Steel Tubes Co., Grand River Station, Detroit, Mich.
Johnson-Peter Co., Warehouse No. 34, Bush Terminal, Brooklyn, N. Y.
Keating, E. F., Co., 446-54 Water St., New York, N. Y.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Seamless Tube Co., The, Beaver Falls, Pa.
Ryerson, Jos. T., & Son, 16th and Rockwell Sts., Chicago, Ill.

BOLT AND NUT MACHINERY
Howard Iron Works, 287 Chicago St., Buffalo, N. Y.
National Machinery Co., Tiffin, O.

BOLTS (Connecting Rod)
Ferry Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.

BOLTS (Heat Treated)
Bethlehem Steel Co., Bethlehem, Pa.
Lake Erie Bolt & Nut Co., 915 East 63rd St., Cleveland, O.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Milldale, Conn.
Ferry Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Lake Erie Bolt & Nut Co., 915 East 63rd St., Cleveland, O.
Oliver Iron & Steel Co., Pittsburgh, Pa.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Chicago, Ill.

BOOKS (Technical)
Penton Publishing Co., Cleveland, O.

BORING, DRILLING AND MILLING MACHINES
McCabe, J. J., Lathe & Machinery Corp., 1805-10 Singer Bldg., New York City.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Pawling & Harnischfeger Co., 38th & National Aves., Milwaukee, Wis.

BORING MILLS
McCabe, J. J., Lathe & Machinery Corp., 1805-10 Singer Bldg., New York City.
Simmons Machine Co., Inc., Albany, N. Y.

BORING AND TURNING MACHINES
McCabe, J. J., Lathe & Machinery Corp., 1805-10 Singer Bldg., New York City.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

BRAKES (Electric)
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.
General Electric Co., Schenectady, N. Y.

BRASS GOODS
Lunkenheimer Co., The, Cincinnati, O.

BRAZING OUTFITS
Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.
Oxweld Acetylene Co., Newark, N. J.

BRICK (Silica, Magnesia, Chrome)
Pyro Clay Products Co., The, Oakhill, O.
Soisson, Jos., Fire Brick Co., Connellsville, Pa.
Van Dyke Silica Brick Co., Johnstown, Pa.

BRICK INSULATING—See INSULATING BRICK

BRICKMAKING MACHINERY
Bonnot Co., The, Canton, O.

BRIDGE CRANES (Ore and Coal Handling)
McMyler Interstate Co., The, Bedford, O.

BRIDGES, BUILDINGS AND VIADUCTS (Steel)
American Bridge Co., 71 Broadway, New York, N. Y.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Chicago Bridge & Iron Works, Transportation Bldg., Chicago, Ill.
Erie Steel Construction Co., Erie, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.

BRONZE (Manganese)
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BUCKETS (Clam Shell)
Hayward Co., The, 50-54 Church St., New York City.
McMyler Interstate Co., Bedford, O.

BUCKETS (Drag Line)
Hayward Co., The, 50-54 Church St., New York City.

BUCKETS (Dumping)
Atlas Car & Mfg. Co., Dept. E., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., Carbondale, Pa.

BUCKETS (Grab)
Brosius, Edgar E., Pittsburgh, Pa.
Brown Hoisting Machinery Co., Cleveland, O.
Hayward Co., The, 50-54 Church St., New York City.
Link-Belt Co., Chicago, Ill.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.
Williams, G. H., Co., Erie, Pa.

BUILDINGS (Steel)—See BRIDGES, BUILDINGS AND VIADUCTS

BULLDOZERS
Simmons Machine Co., Inc., Albany, N. Y.

BURLAP BAGS AND STRIPS
Chesler, H., Burlap Bag Co., 2676 E. 37th St., Cleveland, O.

BURNERS (Acetylene)—See TORCHES AND BURNERS (Acetylene, Blow, Oxyacetylene)

BURNERS (Fuel Oil, Gas and Combination)
Davison, N. C., Gas Burner & Welding Co. 2939 Smallman Ave., Pittsburgh, Pa.
Gardner Fuel Oil Burner Co., Friendship, N. Y.
Maxon Furnace & Engrg. Co., The, Muncie, Ind.

BUSINESS CARDS (Engraved)
Wiggins, John B., Co., 705 Peoples Gas Bldg., Chicago, Ill.

BY-PRODUCT PLANTS
Belgian-American Coke Ovens Corp., 686 Catalan Ave., St. Louis, Mo.
Koppers Co., The, Union Arcade, Pittsburgh, Pa.

CALCIUM CARBIDE
Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.

CAN MAKING MACHINERY
Ams, Max, Machine Co., 101 Park Ave., New York City.
Bliss, E. W., Co., 8 Adams St., Brooklyn, N. Y.

CAR DUMPERS
McMyler Interstate Co., The, Bedford, O

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., Dept. E., Cleveland, O

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Fdy. & Mach. Co., Birdsboro, Pa.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Otis Steel Co., Cleveland, O.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.

CASTINGS (Brass, Bronze and Aluminum)
American Manganese Bronze Co., Holmesburg Junction, Philadedphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
General Bronze Foundry Co., The, 1275 East 54th St., Cleveland, O.
Keystone Bronze Co., 39th St., Pittsburgh, Pa.
Klotz Machine Co., Sandusky, O.
Lawrenceville Bronze Co., 611 Bessemer Bldg., Pittsburgh, Pa.
Shoop Bronze Co., The, 344 West Sixth St., Tarentum, Pa.
Turner & Seymour Mfg. Co., Torrington, Conn.

CASTINGS (Chemical)
Buffalo Foundry & Machine Co., 1543 Fillmore Ave., Buffalo, N. Y.

CASTINGS (Converter)
Reading Steel Casting Co., Reading, Pa.

CASTINGS (Copper)
Keystone Bronze Co., 39th St., Pittsburgh, Pa.
Lawrenceville Bronze Co., 611 Bessemer Bldg., Pittsburgh, Pa.
New Process Copper Casting Co., 5323-25 Butler St., Pittsburgh, Pa.

CASTINGS (Electric Process)
Acme Steel & Malleable Iron Works, Buffalo, N. Y.
Farrell-Cheek Steel Foundry Co., Sandusky, Ohio.
Keokuk Steel Castings Co., Keokuk, Iowa.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Milwaukee Steel Foundry Co., 101-121 S. Water St., Milwaukee, Wis.
Pelton Steel Co., Milwaukee, Wis.

CASTINGS (Gear)
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich
Otis Steel Co., Cleveland, O.

CASTINGS (Gray Iron)
Adamson Machine Co., Akron, O.
Bethlehem Steel Co., The, Bethlehem, Pa.
Birdsboro Steel Fdy. & Machy. Co., Birdsboro, Pa.
Buffalo Foundry & Machine Co., 1543 Fillmore Ave., Buffalo, N. Y.
Caroline Foundry Co., 723 S. Caroline St., Baltimore, Md.
Cascade Foundry Co., Erie, Pa.
Cyclops Foundry Co., Pittsburgh, Pa.
Ellwood Foundry & Machine Co., Ellwood City, Pa.
Erie Foundry Co., Erie, Pa.
Klotz Machine Co., Sandusky, O.
Lake Shore Engine Works, Marquette, Mich.
Link-Belt Co., Chicago, Ill.
Love Brothers, Inc., Aurora, Ill.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Merrill Machinery & Supply Co., Merrill, Wis.
Monessen Foundry & Machine Co., Monessen, Pa.
National Roll & Foundry Co., Avonmore, Pa.
North Buffalo Hardware Foundry Co., Buffalo, N. Y.
Ohio Foundry Co., Cleveland, O.
Pennsylvania Engineering Works, New Castle, Pa.
Standard Engrg. Co., Ellwood City, Pa.
Standard Foundry Co., Buffalo, N. Y.
St. Louis Malleable Casting Co., St. Louis, Mo.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Turner & Seymour Mfg. Co., Torrington, Conn.
Wheeling Mold & Foundry Co., Wheeling, W. Va.
Williamson, J. E., Co., Bellwood, Pa.

CASTINGS (Malleable)
Acme Steel & Malleable Iron Works, Inc., Buffalo, N. Y.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

STEEL STAMPS DIES CHECKS BADGES STENCILS

PANNIER
Metal Tag Addresser

A *PANNIER* Metal Tag Addresser will enable you to secure proper identification of shipments, by means of metal tags with embossed lettering. Such tags cannot become detached, defaced or in any way obliterated.

Positively no more lost or delayed shipments through poor marking! Isn't it worth investigating?

You may be able to use one to distinct advantage economically. Particulars gladly furnished on request.

The Master Marker
with
Pannier Bros. Stamp Co.
210 Sandusky St.
PITTSBURGH, PA.

MASTER PANNIER MARKERS

Ransom Wet Tool Grinding Machine

Belt or Motor Drive

They do not splash, therefore they can be placed where most needed, not where they will do the least damage.

The method of water control overcomes splashing, soaking of the wheel in spots, unbalanced wheels, pump troubles and the usual unsanitary conditions.

Ransom Manufacturing Co.
Oshkosh Wis. U. S. A.

Hand Benders

Angle, Eye, Ring and Hinge,

for light, medium and heavy factory service, accurately turning bar iron and steel (rounds and flats) to any desired angle or form, eyes with and without offset, brackets, hangers, staples, cranks, yokes, etc., at great saving of labor and time. "The Bending Book" free on request.

D. A. HINMAN & CO.
20 Main St. Sandwich, Ill.

PUMPS
INDUSTRIAL—MUNICIPAL—AGRICULTURAL—RESIDENTIAL
A Type for Every Service
Bulletins on request.
THE GOULDS MANUFACTURING COMPANY
Seneca Falls, N. Y.
GOULDS

Morris Machine Works
Baldwinsville, N. Y.
Builders of Centrifugal Pumping Machinery since the Civil War
Branches in Principal Cities

ALLIS-CHALMERS
MILWAUKEE, WIS. U. S. A.
Power and Electrical Machinery, Steam, Gas and Oil Engines, Centrifugal Pumps, Condensers, Air Compressors, Power Transmission Machinery, Dust Collectors, etc.

CHAMBERSBURG
STEAM HAMMERS
HYDRAULIC MACHINERY
Built in all sizes for every class of work.
ECONOMICAL—RELIABLE—EFFICIENT
CHAMBERSBURG ENGINEERING CO., Chambersburg, Pa.

CLEVELAND
POCKET-IN-HEAD
RIVETERS

HIT HARDER
RUN FASTER
AND USE LESS AIR THAN ANY RIVETER MADE
Write for Bulletin No. 53
THE CLEVELAND PNEUMATIC TOOL CO.
Branch Offices in all large cities Cleveland, Ohio, U. S. A.

CASTINGS (Malleable) (Continued)
American Malleable Castings Association, 1900 Euclid Ave., Cleveland, O.
Belle City Malleable Iron Co., Racine, Wis.
Columbus Malleable Iron Co., Columbus, O.
Danville Malleable Iron Co., Danville, Ill.
Dayton Malleable Iron Co., Dayton, O.
Frazer & Jones, Syracuse, N. Y.
Illinois Malleable Iron Co., Chicago, Ill.
Iowa Malleable Iron Co., Fairfield, Iowa.
Kalamazoo Malleable Iron Co., Kalamazoo, Mich.
Lakeside Malleable Castings Co., Racine, Wis.
Link-Belt Co., P. O. Box 346, Indianapolis, Ind.
Marion Malleable Iron Wks., Marion, Ind.
Maumee Malleable Castings Co., The, Woodville St., Toledo, O.
Moline Malleable Iron Co., St. Charles, Ill.
Newark Malleable Iron Works, Newark, N. J.
Northern Malleable Iron Co., St. Paul, Minn.
Peoria Malleable Castings Co., Peoria, Ill.
Pittsburgh Malleable Iron Co., Pittsburgh, Pa.
Rockford Malleable Iron Works, Rockford, Ill.
Ross-Meehan Foundries, Chattanooga, Tenn.
St. Louis Malleable Castings Co., St. Louis, Mo.
Symington, T. H., Co., The, Lincoln Park Works, Rochester, N. Y.
Temple Malleable Iron & Steel Co., Harrison Bldg., Philadelphia, Pa.
Vermillion Malleable Iron Co., Hoopeston, Ill.
Wanner Malleable Iron Co., Hammond, Ind.
Wisconsin Malleable Iron Co., Milwaukee, Wis.
Zanesville Malleable Iron Co., Zanesville, O.

CASTINGS (Semisteel)
Buffalo Foundry & Machine Co., 1543 Fillmore Ave., Buffalo, N. Y.
National Roll & Foundry Co., Avonmore, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

CASTINGS (Steel)
Allegheny Steel Co., Pittsburgh, Pa.
Atlantic Steel Castings Co., Chester, Pa.
Atlas Steel Casting Co., Buffalo, N. Y.
Bethlehem Steel Co., The, Bethlehem, Pa.
Birdsboro Steel Fdry. & Machine Co., Birdsboro, Pa.
Chicago Steel Foundry Co., 37th and Kedzie Ave., Chicago, Ill.
Connellsville Fdry. Mach. & Steel Casting Co., 1212 Park Bldg., Pittsburgh, Pa.
Crucible Steel Casting Co., Cleveland, O.
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.
Federal Steel Foundry Co., Chester, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Millbury Steel Foundry Co., Millbury, Mass.
Niagara Electric Steel Corp., 5 Mechanic St., North Tonawanda, N. Y.
Ohio Steel Foundry Co., The, Springfield, O.
Otis Steel Co., Cleveland, O.
Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa.
Reading Steel Casting Co., Reading, Pa.
Reliance Steel Castings Co., 28th and Smallman Sts., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sharon Foundry Co., Sharon, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Sivyer Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
West Steel Castings Co., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CAST IRON PIPE
United States Cast Iron Pipe & Fdry. Co., Burlington, N. J.

CASTORS (Plate Mill)—See PLATE CASTORS

CEMENT MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bonnot Co., The, Canton, O.

CENTER PLATES (Railroad)
Transue & Williams Steel Forging Corp., Alliance, O.

CENTRAL STATION EQUIPMENT
General Electric Co., Schenectady, N. Y.

CHAIN DRIVES
Link-Belt Co., Chicago, Ill.

CHANNELS—See STEEL (Structural)

CHAPLETS
Champion Mch. & Forging Co., Cleveland, O.
Erdle Perforating Co., Rochester, N. Y.

CHARCOAL
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.

CHECKS (Time, Tool and Pay)
Matthews & Co., James H., 3942 Forbes St., Pittsburgh, Pa.
Pannier Bros. Stamp Co., 210 Sandusky St., Pittsburgh, Pa.

CHEMICALS
Ford, J. B., Co., The, Wyandotte, Mich.

CHISEL BLANKS
Hunter Saw & Machine Co., 57th and Butler Sts., Pittsburgh, Pa.

CHROME VANADIUM STEEL (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

CHUCKS
Chicago Pneumatic Tool Co., 6 East 44th St., New York.

CHUCKS (Lathe)
Whiton, D. E., Mach. Co., New London, Conn.

CLAY MACHINERY
Bonnot Co., The, Canton, O.

CLEANER (Metal)
Ford, J. B., Co., The, Wyandotte, Mich.

CLEANING SPECIALTIES
Ford, J. B., Co., The, Wyandotte, Mich.

CLUTCHES (Friction)
Caldwell, W. E., Co., 210 Brandeis St., Louisville, Ky.

COAL AND COKE
Addy, Matthew, Co., The, Cincinnati, O.
Bethlehem Steel Co., Bethlehem, Pa.
Byers, W. L., & Co., 807 Fidelity Title & Trust Bldg., Uniontown, Pa.
Crocker Bros., 21 E. 40th St., New York City.
Eaton, Rhodes & Co., Cincinnati, O.
Hanna, M. A., & Co., Cleveland, O.
Hickman, Williams & Co., 1343 Oliver Bldg., Pittsburgh, Pa.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Iron Trade Products Co., 903 Farmers Bank Bldg., Pittsburgh, Pa.
Irwin Fuel Co., First National Bank Bldg., Latrobe, Pa.
Peabody Fuel Co., 1607 Oliver Bldg., Pittsburgh, Pa.
Pilling & Co., Real Estate Trust Bldg., Philadelphia, Pa.
Rogers, Brown & Co., Cincinnati, O.
Snyder, W. P., Co., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

COAL CRUSHERS AND PULVERIZERS
Bartlett & Snow, C. O., Co., Cleveland, O.
Bonnot Co., The, Canton, O.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.

COAL, ORE AND ASH HANDLING MACHINERY
Bartlett & Snow, C. O., Co., Cleveland, O.
Brown Hoisting Machinery Co., Cleveland, O.
Link-Belt Co., Chicago, Ill.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.

COAL (Smithing)
Rogers, Brown & Co., Cincinnati, O.

COCKS
Crane Co., The, 836 S. Michigan Ave., Chicago.

COILS (Pipe)
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.

COKE (See COAL AND COKE)

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., Cleveland, O.

COKE OVENS (By-Product)
Belgian-American Coke Ovens Corp., 686 Catalan Ave., St. Louis, Mo.
Koppers Co., The, Pittsburgh, Pa.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York.

COMPRESSORS (Gas)
Ingersoll-Rand Co., 11 Broadway, New York.

CONCRETE INSERTS
Dayton Malleable Iron Co., Dayton, Ohio.

CONCRETE MIXERS—See MIXERS (Concrete)

CONDENSERS
Cooper, C. & G., Mt. Vernon, O.
Ingersoll-Rand Co., 11 Broadway, New York.
Mesta Machine Co., Pittsburgh, Pa.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, Ohio.

CONNECTING RODS
Leard, Wm., Co., The, New Brighton, Pa.
Standard Gauge Steel Co., Beaver Falls, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

CONTRACT WORK
Loew Mfg. Co., The, Madison Ave. & W. 90th St., Cleveland, O.
Merrill Machinery & Supply Co., Merrill, Wis.

CONTRACTORS—See ENGINEERS and CONTRACTORS

CONTROLLERS (Electric)
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.

CONVEYORS (Elevating and Conveying)
Bartlett & Snow Co., C. O., Cleveland, O.
Link-Belt Co., Chicago, Ill.
Roots, P. H. & F. M., Co., Connersville, Ind.

COOLING BEDS
Morgan Construction Co., Worcester, Mass.

COPPER AND BRASS WIRE AND BAR DRAWING EQUIPMENT
Garrison, A., Foundry Co., Bingham St., Pittsburgh, Pa.

CORE OIL
Thompson & Co., 857 North Ave., Pittsburgh, Pa.

CORE OVENS
Ryan & Company, F. J., Wesley Bldg., Philadelphia, Pa.

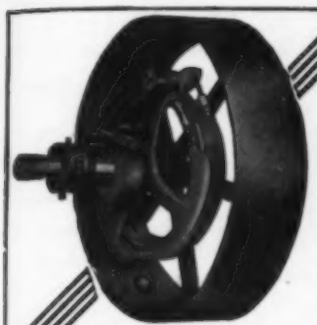
CORE SAND MIXERS
Standard Sand & Machine Co., 5151 St. Clair Ave., Cleveland, O.

COUPLINGS
Roots, P. H. & F. M., Co., Connersville, Ind.

CRANES (Charging)
Alliance Machine Co., Alliance, O.
Cleveland Crane & Engrg. Co., Wickliffe, O.

CRANES (Electric Traveling)
Alliance Machine Co., Alliance, O.
Box, Alfred, & Co., Inc., Front and Poplar Sts., Philadelphia, Pa.
Cleveland Crane & Engineering Co., Wickliffe, O.
Erie Steel Construction Co., Erie, Pa.
Euclid Crane & Hoist Co., Dept. B, Euclid, O.
Milwaukee Elec. Crane & Mfg. Co., Milwaukee, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Northern Engineering Works, 214 Chene St., Detroit, Mich.
Pawling & Harnischfeger Co., Milwaukee, Wis.
Payne, N. B., & Co., 25 Church St., New York City.
Pittsburgh Crane & Equip. Co., Sharpsburg, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Hand)
Cleveland Crane & Engrg. Co., Wickliffe, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.



A Firm Grip

The asbestos lining in the flexible band of the Caldwell Friction Clutch is your sure guarantee of a firm grip on the friction ring and a steady power-pull with a minimum of slippage.

Simplicity of adjustment—a single screw, and ease of operation—one lever, make the Caldwell the intelligent choice for difficult service.

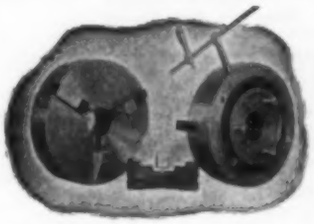
Send for catalog

W. E. Caldwell Co.
Incorporated
210 E. Brandeis St., Louisville, Ky.

Caldwell
FRICTION CLUTCHES

PHOENIX
METAL ROLLS
PHOENIX ROLL WORKS
PITTSBURGH, PA.

CHUCKS



Small Size—for precision work, etc.
Standard Lathe size.
Special Extra Heavy—for turret lathes, duplicate work, etc.

Jaws are either independently adjustable or universally adjustable on the first type and either or both on last two types.

We also make Centering Machines and Gear Cutting Machines

THE D. E. WHITON MACHINE CO.
NEW LONDON, CONN.

ROLLS SAND AND CHILLED

CASTINGS
Rolling Mill Machinery

Hyde Park Foundry & Machine Co.
Hyde Park (West Penn. Div. P. R. R.), Pa.

HUNTER SAWS

All Types of Circular Saws for Cutting Metal

Inserted tooth saws, solid tooth milling saws made of chrome alloy, semi-high and high-speed steels, hot saws, friction discs. Saw Sharpening machines.

Have you tried our "Beskut" semi-high speed milling saws? They will cut costs on hard jobs.
We also manufacture and carry in stock a full line of rivet sets and chisel blanks.

HUNTER SAW & MACHINE CO., Pittsburgh, Pa.

SAND CHILLED
ROLLS

One plant devoted exclusively to Rolls

Roll-Lathes Shears
Spike Machines
Rolling Mill Machinery

ENGINEERS · FOUNDERS · MACHINISTS
Iron Castings
The Youngstown Fdy. & Mch. Co.
Youngstown, Ohio.

HERRINGBONE CUT GEARS

MILL DRIVES
SPEED REDUCERS

FAWCUS

SPUR
WORM
BEVEL GEARS

FAWCUS MACHINE CO., PITTSBURGH, PA.
2818 Smallman Street

SHEAR BLADES

THE CLEVELAND KNIFE & FORGE COMPANY
1960 West 114 St. Cleveland, Ohio

"TRY SIMONDS GEARS"
They are accurately cut.
All kinds and all materials.
THE SIMONDS MANFG. CO.
PITTSBURGH, PA.

The Woodard Machine Co.
WOOSTER, OHIO
CUT GEARS
SPUR, BEVEL AND HELICAL
ROLLING MILL MACHINERY

CRANES (Hydraulic)
Alliance Machine Co., Alliance, O.
Chambersburg Engrg. Co., Chamberaburg, Pa.
Cleveland Crane & Engrg. Co., Wickliffe, O.

CRANES (Jib)
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANES (Locomotive)
Brown Hoisting Machinery Co., Cleveland, O
Green, L. A., Rail & Mchy. Co., 1115 First Nat'l Bank Bldg., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
McMyler Interstate Co., Bedford, O.
Northwest Engineering Co., Green Bay, Wis.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Pillar)
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANES (Portable)
Byers, John F., Machine Co., The, 235 Sycamore St., Ravenna, O.
Pawling & Harnischfeger Co., 38th & National Aves., Milwaukee, Wis.

CRANES (Portable Floor)
Ellwood Foundry & Machine Co., Ellwood City, Pa.

CRANES (Steam and Pneumatic, Wire Mills)
Cleveland Crane & Engrg. Co., Wickliffe, O.

CRANES (Wall)
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

CRANK SHAFTS
Bethlehem Steel Co., Bethlehem, Pa.
Leard, Wm., Co., The, New Brighton, Pa.
Moltrup Steel Products Co., The, Beaver Falls, Pa.
Pollak Steel Co., The, Cincinnati, O.
Standard Gauge Steel Co., Beaver Falls, Pa.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bonnot Co., The, Canton, O.

CUPRO-VANADIUM
Vanadium Corp. of America, Equitable Bldg., New York.

CUTTING AND WELDING (Oxy-Acetylene Process)—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

CUTTING AND WELDING APPARATUS—See WELDING AND CUTTING APPARATUS (Electric)

CUTTING OFF MACHINES
Cleveland Punch & Shear Works Co., Cleveland, O.

CYANIDE POTS
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.

CYLINDERS (Acetylene)—See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen)—See OXYGEN IN CYLINDERS

CYLINDERS (Pressure)
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

DIE BLANKS
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Forge & Knife Co., Pittsburgh.
Otis Steel Co., Cleveland, O.
Pollak Steel Co., The, Cincinnati, O.

DIE BLOCKS (Pressed and Hammered)
Bethlehem Steel Co., Bethlehem, Pa.

DIES
Bethlehem Steel Co., Bethlehem, Pa.
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.
Hunt & Dorman Mfg. Co., The, 1600 E. 24th St., Cleveland, O.
Toledo Machine & Tool Co., Toledo, O.
Vanadium Corp. of America, Equitable Bldg., New York.

DIES (Lettering and Embossinig)
Pannier Bros. Stamp Co., 210 Sandusky St., Pittsburgh, Pa.

DOLOMITE
Herzog, John, & Son, Forest, Ohio.

DOORS (Rolling and Bifolding, Steel and Wood)
Kinnear Mfg. Co., The, Columbus, O.

DOUBLE SEAMERS
Ams, Max, Machine Co., The, 101 Park Ave., New York, N. Y.

DRAW BENCHES
Standard Engineering Co., Ellwood City, Pa.

DRAWING TABLES
Hein Furniture Co., 126-136 S. Huron St., Toledo, O.

DRILLING MACHINERY
McCabe, J. J., Lathe & Machinery Corp., 1805-10 Singer Bldg., New York City.
Metzler, Robt. J., Inc., 15 Mechanic St., Newark, N. J.
Niles-Bement-Pond Co., 111 Broadway, N. Y. C.
Simmons Machine Co., Inc., Albany, N. Y.

DRILLS
Chicago Pneumatic Tool Co., 6 East 44th St., New York.

DRILLS (Electric)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.

DRILLS (Pneumatic)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

DRILLS (Rock)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

DRIVES (Cut Herringbone Gears)
Mesta Machine Co., Oliver Bldg., Pittsburgh.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett & Snow, C. O., Co., Cleveland, O.
Bonnot Co., The, Canton, O.

DRYERS (Vacuum)
Buffalo Foundry & Machine Co., 1543 Fillmore Ave., Buffalo, N. Y.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland.
General Electric Co., Schenectady, N. Y.

ELECTRIC HEATERS (for Rivets, Bolts, Drop Forgings, Rods)
American Car & Foundry Co., 165 Broadway, New York, N. Y.

ELECTRIC TOOLS (Portable)—See TOOLS (Portable Electric)

ELECTROLYTIC CELLS
Electrolabs Co., The, 2635 Penn Ave., Pittsburgh, Pa.

ELECTROLYTIC OXYGEN AND HYDROGEN GENERATORS
Electrolabs Co., The, 2635 Penn Ave., Pittsburgh, Pa.

ELEVATOR GUIDES
Standard Gauge Steel Co., Beaver Falls, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

ELEVATORS (Bucket)
Bartlett & Snow, C. O., Co., Cleveland.
Link-Belt Co., Chicago, Ill.

EMERY WHEEL DRESSERS
Calder, Geo. H., Co., 626 N. Prince St., Lancaster, Pa.

ENGINE LATHES—See LATHES (Engine)

ENGINEERS AND CONTRACTORS
Erie Steel Construction Co., Inc., Erie, Pa.
Freyn, Brassert & Co., Peoples Gas Bldg., Chicago.
Garrison, A., Foundry Co., Bingham St., Pittsburgh.
Hagan, George J., Co., Peoples Bank Bldg., Pittsburgh, Pa.
McClure, Geo. W., Sons & Co., Pittsburgh, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Smythe, S. R., Co., The, Pittsburgh, Pa.
Sutton-Abramsen Engrg. Co., Pittsburgh, Pa.
Swindell, Wm., & Bros., Pittsburgh, Pa.

ENGINEERS (Consulting)
Ellis, Frank I., 2127 Farmers Bldg., Pittsburgh, Pa.
Freyn, Brassert & Co., Peoples Gas Bldg., Chicago.
Kennedy, Julian, Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Moore, W. E., & Co., Union Bank Bldg., Pittsburgh.
Shover, Barton R., 424 Oliver Bldg., Pittsburgh.

ENGINEER, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Co., The, Pittsburgh, Pa.

ENGINEERS (Foundry)
Rathbone, John A., 242 W. Jefferson Ave., Detroit, Mich.
Standard Sand & Mach. Co., Cleveland, O.

ENGINEERS (Industrial)
Bedaux, Chas. E., Co., The, 4500 Euclid Ave., Cleveland, O.
Gosselin, Edward N., 816 Second National Bank Bldg., New Haven, Conn.

ENGINES, BLOWING (Gas or Steam)
Mesta Machine Co., Pittsburgh, Pa.

ENGINES (Gas)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Cooper, C. & G., Mt. Vernon, O.
Mesta Machine Co., Pittsburgh, Pa.

ENGINES (Oil)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

ENGINES (Steam)
Cooper, C. & G., Co., Mt. Vernon, O.
Mesta Machine Co., Pittsburgh, Pa.

ENGINES (Vertical, Enclosed, Self Oiling)
Engberg's Electric & Mechanical Works, 19 Vine St., St. Joseph, Mich.

ENGRAVERS (Steel and Copper Plate)
Wiggins, John B., Co., 705 Peoples Gas Bldg., Chicago.

EVAPORATORS
Buffalo Foundry & Machine Co., 1543 Fillmore Ave., Buffalo, N. Y.

EXHAUSTERS (Gas)—See GAS EXHAUSTERS

EXPANDED AND PERFORATED METAL
McCalla, Harold, Co., The, Pier 56, North Wharves, Delaware River, Philadelphia, Pa.

FACING SAND MIXERS
Standard Sand & Machine Co., 5151 St. Clair Ave., Cleveland, O.

FACTORY BUILDING—See BRIDGES, BUILDINGS AND VIADUCTS

FANS (Heating and Ventilating)
Buckeye Blower Co., Columbus, O.
Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.

FANS (Mechanical Draft)
Buckeye Blower Co., Columbus, O.

FENCES—See WIRE FENCES

FERRO-ALLOY
Keokuk Electro-Metals Co., 136 So. La Salle St., Chicago, Ill.
United States Ferro Alloys Corp., 34 East 42nd St., New York, N. Y.

FERRO-CARBON TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

PHILLIPS & McLAREN CO.

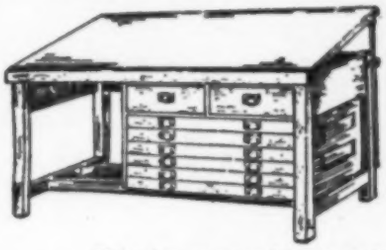
We manufacture

Grinding Pans

of all types and sizes for mill and foundry use, and Crushers.

24TH & SMALLMAN STS., PITTSBURG, PA.

The Oldest Manufacturing Firm of DRAWING TABLES AND FILING CASES



Has its product in use in all parts of the world. 24 styles of Tables and all kinds of Filing Cases to select from.

Tables and Cases pay for themselves through convenience.

Write for prices and illustrated catalogue

THE HEIN FURNITURE CO. Toledo, Ohio

Factory and Office: 126-136 S. Huron St.

AIRCO

Oxygen

Acetylene

Carbide

Nitrogen

Argon

and other Atmospheric Gas Products

Airco-Davis-Bournonville Welding and Cutting Apparatus and Supplies

Acetylene Generators

Specially Designed Machines for Automatic Welding and Cutting

DAVIS

"Airco Oxygen and Acetylene Service Is Good Service"

Airco District Offices and Distributing Stations

An Airco Distributing Station is located in each of the following cities. District Offices are located in cities indicated by a star (*).

Albany, N. Y.
*Atlanta, Ga. 43 Houston St.
*Boston, Mass. 122 Mt. Vernon St. Dorchester
Baltimore, Md.
Bethlehem, Pa.
Bridgeport, Conn.
Brooklyn, N. Y.
Bronx, N. Y.
*Buffalo, N. Y. 730 Grant St.
*Chicago, Ill. 2236 So. Lumber St.
*Cleveland, O. 1210 W. 69th St.
Cincinnati, O.
Coatesville, Pa.
Columbus, O.
Defiance, O.
Des Moines, Ia.
*Detroit, Mich. 7991 Hartwick St.
Duluth, Minn.
East Chicago, Ind.
East St. Louis, Ill.
*Emeryville, Calif. Park Ave. and Hallock St.
Erie, Pa.
Ft. Wayne, Ind.
Gloucester, N. J.
Grand Rapids, Mich.
Hartford, Conn.
Indianapolis, Ind.
Jersey City, N. J.
Johnstown, Pa.
Joplin, Mo.
Kansas City, Mo.
Lebanon, Pa.
*Los Angeles, Cal. 4th and Main Sts.
Louisville, Ky.
Madison, Ill.
Milwaukee, Wis.
*Minneapolis, Minn. 327 25th Ave., S. E.
New Haven, Conn.
*New York, N. Y. (Metropolitan District) 342 Madison Ave. Jersey City Brooklyn, N.Y. Bronx, N.Y.
Norfolk, Va.
*Oklahoma City, Okla. P. O. Box 1338
Paterson N. J.
Peoria, Ill
*Philadelphia, Pa. Germantown and Allegheny Aves.
*Pittsburgh, Pa. 2515 Liberty Ave.
Portland, Ore.
*Richmond, Va P. O. Box 1192
San Francisco, Calif.
*Seattle, Wash 3623 E. Marginal Way
Sharon, Pa.
Springfield, O.
*St. Louis, Mo. 115 Plum St
Tacoma, Wash.
Terre Haute, Ind.
Toledo, O.
Tulsa, Okla.
Warren, O.
West Quincy, Mass.
Youngstown, O

AIR REDUCTION SALES CO.

Mfr. of Airco and Airco-D-B products

Controls the Manufacture and Sale of National Carbide

Home Office: 342 Madison Ave., New York, N. Y.

FLINT SHOT

Sand Blast Abrasive

Reduces production costs and speeds up output

UNITED STATES SILICA CO.

122 South Michigan Ave. Chicago

Sole producers of Flint Shot

THE QUALITY CARD for QUALITY MEN

Peerless Patent Book Form Cards

Will Save You Money Over the Cheapest Card You Can Buy. They'll Not Only Save You Money—*They'll Make You Money.*

These cards are bound in books of twenty-five cards, and DETACHED ONE BY ONE AS USED. Every card, and the engraving or printing on it, is protected by a tissue sheet bound with the cards. By a patented process of manufacture every card has an absolutely smooth edge when detached, defying detection under the most critical examination. Every card is clean, smooth, flat, unmarred and perfect when presented. No cards are lost or thrown away because of soiling.

Send today for sample and detach the cards one by one. Convince yourself that you MUST HAVE THESE CARDS. A mere examination is all that is necessary. ***Send Today.*** ***Established 1857***

THE JOHN B. WIGGINS CO., 705 People's Gas Bldg., Chicago
Engravers, Plate Printers, Die Embossers. 1104 So. Wabash Ave.

MOLDING OVER 98% SILICA SANDBLASTING

PORTAGE SANDS

THE PORTAGE SILICA CO.
YOUNGSTOWN, OHIO

DUSTLESS SELF-CONTAINED AUTOMATIC

HOEVEL SANDBLAST MACHINES

Patented

Dustless Sand Blast Rooms, Rotary Table, Revolving Barrel Sandblast Machines, Hose Sandblast and all other Sandblast Equipment.

Hoevel Manufacturing Corporation 152 Ogden Avenue
Controlled by L. O. Koven & Bro. Jersey City, N. J.

Cleveland Office: 501 Ulmer Bldg.

PATTERNS

WOOD and METAL

Production PLATES MACHINE WORK

Friendship Pattern Works
FRIENDSHIP, N. Y.

BRASS BRONZE ALUMINUM CASTINGS

Try This--In Your Cleaning Room

GLOBE

GLOBE HICH CARBON CHILLED SHOT

unequaled for—

CASTINGS FORGINGS
HEAT TREATED PARTS

The Globe Iron-Crush & Shot Company
(Formerly The Globe Steel Co.)
Mansfield Ohio

TIME CHECKS

Send Your Inquiries and Orders to the Manufacturer

JAS. H. MATTHEWS & CO.
2064 Forbes Field, Pittsburgh, Pa.

MATTHEWS

FERRO-CHROME
Baltimore Electro Alloys Co., The, Lexington Bldg., Baltimore, Md.
Samuel, Frank, Harrison Bldg., Philadelphia, Pa.
United States Ferro Alloys Corp., 34 East 42nd St., New York, N. Y.

FERRO-MANGANESE
Bethlehem Steel Co., Bethlehem, Pa.
Crocker Bros., 21 E. 40th St., New York City.
Rogers, Brown & Co., Cincinnati, O.
Samuel, Frank, Harrison Bldg., Philadelphia, Pa.

FERRO-SILICON
Baltimore Electro Alloys Co., The, Lexington Bldg., Baltimore, Md.
Crocker Bros., 21 E. 40th St., New York City.
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., 136 So. La Salle St., Chicago, Ill.
Rogers, Brown & Co., Cincinnati, O.
Samuel, Frank, Harrison Bldg., Phila.
United States Ferro Alloys Corp., 34 East 42nd St., New York, N. Y.

FERRO-VANADIUM
Vanadium Corp of America, Equitable Bldg., New York,

FIRE BRICK AND CLAY
Ashland Fire Brick Co., Ashland, Ky.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Crescent Refractories Co., Curwensville, Clearfield Co., Pa.
Dover Fire Brick Co., Cuyahoga Bldg., Cleveland.
Green, A. P., Fire Brick Co., Mexico, Missouri.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown, Pa.
Ironton Fire Brick Co., The, Ironton, Ohio.
Kier Fire Brick Co., Pittsburgh, Pa.
Mutton Hollow Fire Brick Co., The, Woodbridge, N. J.
Portsmouth Refractories Co., Portsmouth, O.
Pyro Clay Products Co., The, Oak Hill, O.
Queen's Run Refratcories Co., Inc., Lock Haven, Pa.
Sharon Fire Brick Co., Sharon, Pa.
Star Clay Products Co., Oliver Bldg., Pittsburgh, Pa.
Stowe-Fuller Co., The, Kirby Bldg., Cleveland, Ohio.
Swank's, Hiram, Sons, Inc., Johnstown, Pa.
Union Mining Co., Mt. Savage, Md.

FIRE CLAY (Notch)
Acme Fire Clay & Coal Co., 631 Wabash Bldg., Pittsburgh, Pa.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co., The, Columbus, Ohio.

FIREPROOF CLOTHING
Holcomb Safety Garment Co., 14 S. Jefferson St., Chicago.

FLANGES (Pipe)
Crane Co., The, 836 S. Michigan Ave., Chicago.
Dart, E. M., Mfg. Co., Providence, R. I.

FLOORING (Fireproof, Metallic, Nonslipping, Ventilating)
Irving Iron Works Co., Long Island City, N. Y.

FLUOR SPAR
Hickman, Williams & Co., 1343 Oliver Bldg., Pittsburgh, Pa.
Hillside Fluor Spar Mines, First National Bank Bldg., Chicago, Ill.
Rogers, Brown & Co., Cincinnati, O.

FORGES
Bradley, C. C. & Sons, Inc., Syracuse, N.Y.
Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.

FORGES (Rivet Heating)
Mahr Mfg. Co., 1300 Quincy St., Minneapolis, Minn.

FORGING BILLETS
Andrews Steel Co., Newport, Ky.
United Alloy Steel Corp., Canton, Ohio.
Wheeling Steel Products Co., Wheeling, W. Va.

FORGING BILLETS (Alloy and Carbon Steel)
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.

FORGING INGOTS
Mesta Machine Co., Pittsburgh, Pa.

FORGING MACHINERY
Bliss, E. W., Co., 8 Adams St., Brooklyn.
Erie Foundry Co., The, Erie, Pa.
Garrison, A., Foundry Co Bingham St., Pittsburgh.
Simmons Machine Co., Inc., Albany, N. Y.

FORGINGS (Drop)
Bethlehem Steel Co., Bethlehem, Pa.
Boston & Lockport Block Co., 101 Condor St., E. Boston, Mass.
Canton Forge & Axle Co., 2001-37 Deuber Ave., Canton, Ohio.
Champion Mch. & Forging Co., Cleveland.
Columbus Forge & Iron Co., Columbus, O.
Commercial Drop Forge Co., Lexington Ave., Warren, Pa.
Drop Forging Co. of New York, Jersey City, N. J.
Eccles, Richard Co., Auburn, N. Y.
General Drop Forge Co., Buffalo, N. Y.
Lakeside Forge Co., Erie, Pa.
Pittsburgh Knife & Forge Co., Pittsburgh.
Pollak Steel Co., The, Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Scranton Forging Co., Scranton, Pa.
Strieby & Foot Co., 301 Ogden St., Newark, N. J.
Transue & Williams Steel Forging Corp., Alliance, O.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.
Williams, J. H., & Co., 58 Richards St., Brooklyn, N. Y.

FORGINGS (Iron and Steel)
Akron-Selle Co., Akron, O.
Bay City Forge Co., Erie, Pa.
Bradley, C. C., & Son, Inc., Syracuse, N.Y.
Champion Mch. & Forging Co., Cleveland, O.
Columbus Forge & Iron Co., Columbus, O.
Commercial Drop Forge Co., Lexington Ave., Warren, Pa.
Drop Forging Co. of New York, Jersey City, N. J.
Eccles, Richard, Co., Auburn, N. Y.
Heppenstall Forge & Knife Co., Pittsburgh, Pa.
Leard, Wm., Co., The, New Brighton, Pa.
McWilliams, John, & Sons, 374-84 Sip Ave., Jersey City, N. J.
Mesta Machine Co., Oliver Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Co., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Pollak Steel Co., The Cincinnati, O.
Transue-Williams Steel Forging Corp., Alliance, Ohio.
Vanadium Corp. of America, 120 Broadway, New York, N. Y.

FOUNDRY EQUIPMENT & SUPPLIES
National Engineering Co., MachineryHall Bldg., 549 W. Washington St., Chicago.
Standard Sand & Machine Co., Cleveland.

FOUNDRY PATTERN PLATES (Steel)
Moltrup Steel Products Co., Beaver Falls, Pa.

FRAMES (Wire Drawing)
Morgan Construction Co., Worcester, Mass.

FROGS AND SWITCHES (Railroad and Trolley)
Bethlehem Steel Co., Bethlehem, Pa.

FUEL OIL
Admiral Petroleum Co., 216 Bessemer Bldg., Pittsburgh, Pa.
Oil Creek Refining Co., Titusville, Pa.

FUEL OIL BURNING SYSTEMS AND OIL PLANTS
Hagan, George J., Co., Peoples Bank Bldg., Pittsburgh, Pa.
Maxon Furnace & Engineering Co., The, Muncie, Ind.
Ryan & Company, F. J., Wesley Bldg., Philadelphia, Pa.

FURNACE INSULATION
Celite Products Co., 837 Monadnock Bldg., Chicago, Ill.

FURNACES (Annealing, Case Hardening and Heat Treating)
American Industrial Furnace Corp., 10 Post Office Square, Boston, Mass.
Hagan, Geo. J., Co., Pittsburgh, Pa.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Ryan & Company, F. J., Wesley Bldg., Philadelphia, Pa.

FURNACES (Blast)
Pennsylvania Engrg. Wks., New Castle, Pa.
Smythe, S. R., Co., Pittsburgh, Pa.

FURNACES (Electric)
American Bridge Co., 71 Broadway, New York, N. Y.
General Electric Co., Schenectady, N. Y.
Hagan, George J., Co., Peoples Bank Bldg., Pittsburgh, Pa.
Pittsburgh Electric Furnace Co., Union Bank Bldg., Pittsburgh, Pa.
Ryan & Company, F. J., Wesley Bldg., Philadelphia, Pa.
Swindell, Wm., & Bros., 5035 Jenkins Arcade Bldg., Pittsburgh, Pa.

FURNACES (Open Hearth)
Laughlin, Alex., & Co., First National Bank Bldg., Pittsburgh.
Smythe, S. R., Co., Pittsburgh, Pa.
Swindell, Wm., & Bros., 5035 Jenkins Arcade, Pittsburgh, Pa.

GALVANIZING EQUIPMENT
Erie Foundry Co., Erie, Pa.
Monessen Foundry & Machine Co., Monessen, Pa.

GALVANIZING KETTLES
Wilfong, Millard F., Iron Works Co., Philadelphia, Pa.

GALVANIZING PLANTS
Wilfong, Millard F., Iron Works Co., Philadelphia, Pa.

GANG SLITTERS
Ams, Max, Machine Co., The, 101 Park Ave., New York, N. Y.

GAS BOOSTERS (Rotary Positive Pressure)
Connersville Blower Co., The, Connersville, Ind.

GAS EXHAUSTERS
Connersville Blower Co., Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

GAS PRODUCER PLANTS
Chapman Engineering Co., Mt. Vernon, O.
Hagan, Geo. J., Co., Peoples Bank Bldg., Pittsburgh, Pa.
Koppers Co., The, Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
Wood, R. D., & Co. 400 Chestnut St., Philadelphia, Pa.

GAS RECOVERY COKE OVEN AND GAS PLANTS
Koppers Co., The, Pittsburgh, Pa.

GASOLINE
Admiral Petroleum Co., 216 Bessemer Bldg., Pittsburgh, Pa.

GEAR BLANKS
Akron-Selle Co., Akron, O.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

GEAR CUTTING MACHINERY
Gleason Works, 1000 University Ave., Rochester, N. Y.
McCabe, J. J., Lathe & Machinery Corp., 1805-10 Singer Bldg., New York City.
Simmons Machine Co., Inc., Albany, N. Y.

GEARS AND GEAR CUTTING (Iron & Steel)
Detroit Steel Casting Co., 4069 Michigan Ave., Detroit, Mich.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.
Gleason Works, 1000 University Ave., Rochester, N. Y.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above